

SEQUENCE LISTING

<110> Telford, John L.
Grandi, Guido
Margarit Y Ros, Immaculada
Maione, Domenico

<120> Immunogenic Compositions for Streptococcus agalactiae

<130> PF20665.0003
002441.00189

<140> 10/568,422

<141> 2006-02-14

<150> PCT/US04/030032

<151> 2004-09-15

<150> US 60/548,789

<151> 2004-02-28

<150> PCT/US03/29167

<151> 2003-09-15

<160> 91

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 1662

<212> DNA

<213> Streptococcus agalactiae

<400> 1

atgaaattat	cgaagaagtt	attgtttttc	gctgctgttt	taacaatggt	ggcgggggtca	60
actgttgtaac	cagttagctca	gtttgcgact	ggaatgagta	ttgtaagagc	tgcagaagtg	120
tcacaagaac	gccacgcgaa	aacaacagta	aatatctata	aattacaagc	tgatagttaa	180
aaatcggaac	ttacttctaa	tggtgggtac	gagaataaag	acggcggaag	aatatctaac	240
tatgtctaac	ttggtgacaa	tgtaaaaggt	ttgcaaggtg	tacagtttaa	acgttataaa	300
gtcaagacgg	atatctctgt	tgatgaattg	aaaaaattga	caacagttga	agcagcagat	360
gcacaaagtt	gaacgattct	tgaagaaggt	gtcagctctac	ctcaaaaaac	taagtctcaa	420
ggttttggtcg	tcgatgctct	ggattcaaaa	agtaattgta	gatacttgta	tgtagaagat	480
ttaaagaatt	caccttcaaa	cattacacaa	gcttatgctg	taccgtttgt	gttggaatta	540
ccagttgcta	actctacagg	tacagggttc	ctttctgaaa	ttaatatatta	ccctaaaaac	600
gttgtaactg	atgaacacaa	aacagataaa	gatgttaaaa	aattagggtc	ggacgatgca	660
ggttatatac	ttggtgaaga	attcaaatgg	ttcttgaaat	ctacaatccc	tgccaaattta	720
ggtgactatg	aaaaatttga	aattactgat	aaatttgtag	atggccttgc	ttataaatct	780
gttggaacaa	tcaagattgg	ttcgaaaaca	ctgaatagag	atgagcacta	cactattgat	840
gaaccaacag	ttgataacca	aaatacatta	aaaattacgt	ttaaaccaga	gaattttaa	900
gaaattgctg	agctacttaa	aggaatgacc	cttggttaaaa	atcaagatgc	tcttgataaa	960
gctactgcaa	atacagatga	tcgcgcattt	ttggaatttc	cagttgcatc	aactattaat	1020
gaaaaagcag	ttttaggaac	agcaattgaa	aatacttttg	aacttcaata	tgaccatact	1080
cctgataaag	ctgacaattc	aaaacatctc	aatcctccaa	gaaaaccaga	agttcatact	1140
ggtggggaac	gattttgtaa	gaaagactca	acagaaacac	aaacactag	tggtgctgag	1200

```

tttgatttgt tggcttctga tgggacagca gtaaaatgga cagatgctct tattaaagcg 1260
aatactaata aaaactatat tgctggagaa gctgttactg ggcaaccaat caaatgaaa 1320
tcacatacag acggtacggt tgagattaaa ggtttggctt atgcagttga tgcgaatgca 1380
gaggggtacag cagtaactta caaatataaa gaaacaaaag caccagaagg ttatgtaatc 1440
cctgataaag aaatcgagtt tacagtatca caaacatctt ataatacaaa accaactgac 1500
atcacggttg atagtgtgta tgcaacacct gatacaatta aaacaacaa acgtccttca 1560
atccctaata ctgggtggtat tggtagcgct atctttgtcg ctatcggtgc tgcggtgatg 1620
gcttttgcgt ttaaggggat gaagcgctcg acaaaagata ac 1662

```

<210> 2

<211> 554

<212> PRT

<213> Streptococcus agalactiae

<400> 2

```

Met Lys Leu Ser Lys Lys Leu Leu Phe Ser Ala Ala Val Leu Thr Met
 1          5          10          15
Val Ala Gly Ser Thr Val Glu Pro Val Ala Gln Phe Ala Thr Gly Met
 20
Ser Ile Val Arg Ala Ala Glu Val Ser Gln Glu Arg Pro Ala Lys Thr
 35          40          45
Thr Val Asn Ile Tyr Lys Leu Gln Ala Asp Ser Tyr Lys Ser Glu Ile
 50          55          60
Thr Ser Asn Gly Gly Ile Glu Asn Lys Asp Gly Glu Val Ile Ser Asn
 65          70          75          80
Tyr Ala Lys Leu Gly Asp Asn Val Lys Gly Leu Gln Gly Val Gln Phe
 85          90          95
Lys Arg Tyr Lys Val Lys Thr Asp Ile Ser Val Asp Glu Leu Lys Lys
100          105          110
Leu Thr Thr Val Glu Ala Ala Asp Ala Lys Val Gly Thr Ile Leu Glu
115          120          125
Glu Gly Val Ser Leu Pro Gln Lys Thr Asn Ala Gln Gly Leu Val Val
130          135          140
Asp Ala Leu Asp Ser Lys Ser Asn Val Arg Tyr Leu Tyr Val Glu Asp
145          150          155          160
Leu Lys Asn Ser Pro Ser Asn Ile Thr Lys Ala Tyr Ala Val Pro Phe
165          170          175
Val Leu Glu Leu Pro Val Ala Asn Ser Thr Gly Thr Gly Phe Leu Ser
180          185          190
Glu Ile Asn Ile Tyr Pro Lys Asn Val Val Thr Asp Glu Pro Lys Thr
195          200          205
Asp Lys Asp Val Lys Lys Leu Gly Gln Asp Asp Ala Gly Tyr Thr Ile
210          215          220
Gly Glu Glu Phe Lys Trp Phe Leu Lys Ser Thr Ile Pro Ala Asn Leu
225          230          235          240
Gly Asp Tyr Glu Lys Phe Glu Ile Thr Asp Lys Phe Ala Asp Gly Leu
245          250          255
Thr Tyr Lys Ser Val Gly Lys Ile Lys Ile Gly Ser Lys Thr Leu Asn
260          265          270
Arg Asp Glu His Tyr Thr Ile Asp Glu Pro Thr Val Asp Asn Gln Asn
275          280          285
Thr Leu Lys Ile Thr Phe Lys Pro Glu Lys Phe Lys Glu Ile Ala Glu
290          295          300
Leu Leu Lys Gly Met Thr Leu Val Lys Asn Gln Asp Ala Leu Asp Lys
305          310          315          320

```

Ala Thr Ala Asn Thr Asp Asp Ala Ala Phe Leu Glu Ile Pro Val Ala
 325 330 335
 Ser Thr Ile Asn Glu Lys Ala Val Leu Gly Lys Ala Ile Glu Asn Thr
 340 345 350
 Phe Glu Leu Gln Tyr Asp His Thr Pro Asp Lys Ala Asp Asn Pro Lys
 355 360 365
 Pro Ser Asn Pro Pro Arg Lys Pro Glu Val His Thr Gly Gly Lys Arg
 370 375 380
 Phe Val Lys Lys Asp Ser Thr Glu Thr Gln Thr Leu Gly Gly Ala Glu
 385 390 395 400
 Phe Asp Leu Leu Ala Ser Asp Gly Thr Ala Val Lys Trp Thr Asp Ala
 405 410 415
 Leu Ile Lys Ala Asn Thr Asn Lys Asn Tyr Ile Ala Gly Glu Ala Val
 420 425 430
 Thr Gly Gln Pro Ile Lys Leu Lys Ser His Thr Asp Gly Thr Phe Glu
 435 440 445
 Ile Lys Gly Leu Ala Tyr Ala Val Asp Ala Asn Ala Glu Gly Thr Ala
 450 455 460

 Val Thr Tyr Lys Leu Lys Glu Thr Lys Ala Pro Glu Gly Tyr Val Ile
 465 470 475 480
 Pro Asp Lys Glu Ile Glu Phe Thr Val Ser Gln Thr Ser Tyr Asn Thr
 485 490 495

 Lys Pro Thr Asp Ile Thr Val Asp Ser Ala Asp Ala Thr Pro Asp Thr
 500 505 510
 Ile Lys Asn Asn Lys Arg Pro Ser Ile Pro Asn Thr Gly Gly Ile Gly
 515 520 525
 Thr Ala Ile Phe Val Ala Ile Gly Ala Ala Val Met Ala Phe Ala Val
 530 535 540
 Lys Gly Met Lys Arg Arg Thr Lys Asp Asn
 545 550

 <210> 3
 <211> 517
 <212> PRT
 <213> Streptococcus agalactiae

 <400> 3
 Ala Glu Val Ser Gln Glu Arg Pro Ala Lys Thr Thr Val Asn Ile Tyr
 1 5 10 15
 Lys Leu Gln Ala Asp Ser Tyr Lys Ser Glu Ile Thr Ser Asn Gly Gly
 20 25 30
 Ile Glu Asn Lys Asp Gly Glu Val Ile Ser Asn Tyr Ala Lys Leu Gly
 35 40 45
 Asp Asn Val Lys Gly Leu Gln Gly Val Gln Phe Lys Arg Tyr Lys Val
 50 55 60
 Lys Thr Asp Ile Ser Val Asp Glu Leu Lys Lys Leu Thr Thr Val Glu
 65 70 75 80
 Ala Ala Asp Ala Lys Val Gly Thr Ile Leu Glu Glu Gly Val Ser Leu
 85 90 95
 Pro Gln Lys Thr Asn Ala Gln Gly Leu Val Val Asp Ala Leu Asp Ser
 100 105 110
 Lys Ser Asn Val Arg Tyr Leu Tyr Val Glu Asp Leu Lys Asn Ser Pro
 115 120 125

Ser Asn Ile Thr Lys Ala Tyr Ala Val Pro Phe Val Leu Glu Leu Pro
 130 135 140
 Val Ala Asn Ser Thr Gly Thr Gly Phe Leu Ser Glu Ile Asn Ile Tyr
 145 150 155 160
 Pro Lys Asn Val Val Thr Asp Glu Pro Lys Thr Asp Lys Asp Val Lys
 165 170 175
 Lys Leu Gly Gln Asp Asp Ala Gly Tyr Thr Ile Gly Glu Glu Phe Lys
 180 185 190
 Trp Phe Leu Lys Ser Thr Ile Pro Ala Asn Leu Gly Asp Tyr Glu Lys
 195 200 205
 Phe Glu Ile Thr Asp Lys Phe Ala Asp Gly Leu Thr Tyr Lys Ser Val
 210 215 220
 Gly Lys Ile Lys Ile Gly Ser Lys Thr Leu Asn Arg Asp Glu His Tyr
 225 230 235 240
 Thr Ile Asp Glu Pro Thr Val Asp Asn Gln Asn Thr Leu Lys Ile Thr
 245 250 255
 Phe Lys Pro Glu Lys Phe Lys Glu Ile Ala Glu Leu Leu Lys Gly Met
 260 265 270
 Thr Leu Val Lys Asn Gln Asp Ala Leu Asp Lys Ala Thr Ala Asn Thr
 275 280 285
 Asp Asp Ala Ala Phe Leu Glu Ile Pro Val Ala Ser Thr Ile Asn Glu
 290 295 300
 Lys Ala Val Leu Gly Lys Ala Ile Glu Asn Thr Phe Glu Leu Gln Tyr
 305 310 315 320
 Asp His Thr Pro Asp Lys Ala Asp Asn Pro Lys Pro Ser Asn Pro Pro
 325 330 335
 Arg Lys Pro Glu Val His Thr Gly Gly Lys Arg Phe Val Lys Lys Asp
 340 345 350
 Ser Thr Glu Thr Gln Thr Leu Gly Gly Ala Glu Phe Asp Leu Leu Ala
 355 360 365
 Ser Asp Gly Thr Ala Val Lys Trp Thr Asp Ala Leu Ile Lys Ala Asn
 370 375 380
 Thr Asn Lys Asn Tyr Ile Ala Gly Glu Ala Val Thr Gly Gln Pro Ile
 385 390 395 400
 Lys Leu Lys Ser His Thr Asp Gly Thr Phe Glu Ile Lys Gly Leu Ala
 405 410 415
 Tyr Ala Val Asp Ala Asn Ala Glu Gly Thr Ala Val Thr Tyr Lys Leu
 420 425 430
 Lys Glu Thr Lys Ala Pro Glu Gly Tyr Val Ile Pro Asp Lys Glu Ile
 435 440 445
 Glu Phe Thr Val Ser Gln Thr Ser Tyr Asn Thr Lys Pro Thr Asp Ile
 450 455 460
 Thr Val Asp Ser Ala Asp Ala Thr Pro Asp Thr Ile Lys Asn Asn Lys
 465 470 475 480
 Arg Pro Ser Ile Pro Asn Thr Gly Gly Ile Gly Thr Ala Ile Phe Val
 485 490 495
 Ala Ile Gly Ala Ala Val Met Ala Phe Ala Val Lys Gly Met Lys Arg
 500 505 510
 Arg Thr Lys Asp Asn
 515

<210> 4

<211> 525

<212> PRT

<213> Streptococcus agalactiae

<400> 4

```

Met Lys Leu Ser Lys Lys Leu Leu Phe Ser Ala Ala Val Leu Thr Met
1      5      10
Val Ala Gly Ser Thr Val Glu Pro Val Ala Gln Phe Ala Thr Gly Met
20     25     30
Ser Ile Val Arg Ala Ala Glu Val Ser Gln Glu Arg Pro Ala Lys Thr
35     40     45
Thr Val Asn Ile Tyr Lys Leu Gln Ala Asp Ser Tyr Lys Ser Glu Ile
50     55     60
Thr Ser Asn Gly Gly Ile Glu Asn Lys Asp Gly Glu Val Ile Ser Asn
65     70     75
Tyr Ala Lys Leu Gly Asp Asn Val Lys Gly Leu Gln Gly Val Gln Phe
85     90     95
Lys Arg Tyr Lys Val Lys Thr Asp Ile Ser Val Asp Glu Leu Lys Lys
100    105    110
Leu Thr Thr Val Glu Ala Ala Asp Ala Lys Val Gly Thr Ile Leu Glu
115    120    125
Glu Gly Val Ser Leu Pro Gln Lys Thr Asn Ala Gln Gly Leu Val Val
130    135    140
Asp Ala Leu Asp Ser Lys Ser Asn Val Arg Tyr Leu Tyr Val Glu Asp
145    150    155
Leu Lys Asn Ser Pro Ser Asn Ile Thr Lys Ala Tyr Ala Val Pro Phe
165    170    175
Val Leu Glu Leu Pro Val Ala Asn Ser Thr Gly Thr Gly Phe Leu Ser
180    185    190
Glu Ile Asn Ile Tyr Pro Lys Asn Val Val Thr Asp Glu Pro Lys Thr
195    200    205
Asp Lys Asp Val Lys Lys Leu Gly Gln Asp Asp Ala Gly Tyr Thr Ile
210    215    220
Gly Glu Glu Phe Lys Trp Phe Leu Lys Ser Thr Ile Pro Ala Asn Leu
225    230    235
Gly Asp Tyr Glu Lys Phe Glu Ile Thr Asp Lys Phe Ala Asp Gly Leu
245    250    255
Thr Tyr Lys Ser Val Gly Lys Ile Lys Ile Gly Ser Lys Thr Leu Asn
260    265    270
Arg Asp Glu His Tyr Thr Ile Asp Glu Pro Thr Val Asp Asn Gln Asn
275    280    285
Thr Leu Lys Ile Thr Phe Lys Pro Glu Lys Phe Lys Glu Ile Ala Glu
290    295    300
Leu Leu Lys Gly Met Thr Leu Val Lys Asn Gln Asp Ala Leu Asp Lys
305    310    315
Ala Thr Ala Asn Thr Asp Asp Ala Ala Phe Leu Glu Ile Pro Val Ala
325    330    335
Ser Thr Ile Asn Glu Lys Ala Val Leu Gly Lys Ala Ile Glu Asn Thr
340    345    350
Phe Glu Leu Gln Tyr Asp His Thr Pro Asp Lys Ala Asp Asn Pro Lys
355    360    365
Pro Ser Asn Pro Pro Arg Lys Pro Glu Val His Thr Gly Gly Lys Arg
370    375    380
Phe Val Lys Lys Asp Ser Thr Glu Thr Gln Thr Leu Gly Gly Ala Glu
385    390    395
Phe Asp Leu Leu Ala Ser Asp Gly Thr Ala Val Lys Trp Thr Asp Ala
405    410    415
Leu Ile Lys Ala Asn Thr Asn Lys Asn Tyr Ile Ala Gly Glu Ala Val

```

```

          420                      425                      430
Thr Gly Gln Pro Ile Lys Leu Lys Ser His Thr Asp Gly Thr Phe Glu
          435                      440                      445
Ile Lys Gly Leu Ala Tyr Ala Val Asp Ala Asn Ala Glu Gly Thr Ala
          450                      455                      460
Val Thr Tyr Lys Leu Lys Glu Thr Lys Ala Pro Glu Gly Tyr Val Ile
          465                      470                      475
Pro Asp Lys Glu Ile Glu Phe Thr Val Ser Gln Thr Ser Tyr Asn Thr
          485                      490                      495
Lys Pro Thr Asp Ile Thr Val Asp Ser Ala Asp Ala Thr Pro Asp Thr
          500                      505                      510
Ile Lys Asn Asn Lys Arg Pro Ser Ile Pro Asn Thr Gly
          515                      520                      525

```

```

<210> 5
<211> 5
<212> PRT
<213> Streptococcus agalactiae

```

```

<400> 5
Ile Pro Asn Thr Gly
1                      5

```

```

<210> 6
<211> 520
<212> PRT
<213> Streptococcus agalactiae

```

```

<400> 6
Met Lys Leu Ser Lys Lys Leu Leu Phe Ser Ala Ala Val Leu Thr Met
1                      5                      10                      15
Val Ala Gly Ser Thr Val Glu Pro Val Ala Gln Phe Ala Thr Gly Met
20                      25                      30
Ser Ile Val Arg Ala Ala Glu Val Ser Gln Glu Arg Pro Ala Lys Thr
35                      40                      45
Thr Val Asn Ile Tyr Lys Leu Gln Ala Asp Ser Tyr Lys Ser Glu Ile
50                      55                      60
Thr Ser Asn Gly Gly Ile Glu Asn Lys Asp Gly Glu Val Ile Ser Asn
65                      70                      75                      80
Tyr Ala Lys Leu Gly Asp Asn Val Lys Gly Leu Gln Gly Val Gln Phe
85                      90                      95
Lys Arg Tyr Lys Val Lys Thr Asp Ile Ser Val Asp Glu Leu Lys Lys
100                      105                      110
Leu Thr Thr Val Glu Ala Ala Asp Ala Lys Val Gly Thr Ile Leu Glu
115                      120                      125
Glu Gly Val Ser Leu Pro Gln Lys Thr Asn Ala Gln Gly Leu Val Val
130                      135                      140
Asp Ala Leu Asp Ser Lys Ser Asn Val Arg Tyr Leu Tyr Val Glu Asp
145                      150                      155                      160
Leu Lys Asn Ser Pro Ser Asn Ile Thr Lys Ala Tyr Ala Val Pro Phe
165                      170                      175
Val Leu Glu Leu Pro Val Ala Asn Ser Thr Gly Thr Gly Phe Leu Ser
180                      185                      190
Glu Ile Asn Ile Tyr Pro Lys Asn Val Val Thr Asp Glu Pro Lys Thr
195                      200                      205

```

Asp Lys Asp Val Lys Lys Leu Gly Gln Asp Asp Ala Gly Tyr Thr Ile
 210 215 220
 Gly Glu Glu Phe Lys Trp Phe Leu Lys Ser Thr Ile Pro Ala Asn Leu
 225 230 235 240
 Gly Asp Tyr Glu Lys Phe Glu Ile Thr Asp Lys Phe Ala Asp Gly Leu
 245 250 255
 Thr Tyr Lys Ser Val Gly Lys Ile Lys Ile Gly Ser Lys Thr Leu Asn
 260 265 270
 Arg Asp Glu His Tyr Thr Ile Asp Glu Pro Thr Val Asp Asn Gln Asn
 275 280 285
 Thr Leu Lys Ile Thr Phe Lys Pro Glu Lys Phe Lys Glu Ile Ala Glu
 290 295 300
 Leu Leu Lys Gly Met Thr Leu Val Lys Asn Gln Asp Ala Leu Asp Lys
 305 310 315 320
 Ala Thr Ala Asn Thr Asp Asp Ala Ala Phe Leu Glu Ile Pro Val Ala
 325 330 335
 Ser Thr Ile Asn Glu Lys Ala Val Leu Gly Lys Ala Ile Glu Asn Thr
 340 345 350
 Phe Glu Leu Gln Tyr Asp His Thr Pro Asp Lys Ala Asp Asn Pro Lys
 355 360 365
 Pro Ser Asn Pro Pro Arg Lys Pro Glu Val His Thr Gly Gly Lys Arg
 370 375 380
 Phe Val Lys Lys Asp Ser Thr Glu Thr Gln Thr Leu Gly Gly Ala Glu
 385 390 395 400
 Phe Asp Leu Leu Ala Ser Asp Gly Thr Ala Val Lys Trp Thr Asp Ala
 405 410 415
 Leu Ile Lys Ala Asn Thr Asn Lys Asn Tyr Ile Ala Gly Glu Ala Val
 420 425 430
 Thr Gly Gln Pro Ile Lys Leu Lys Ser His Thr Asp Gly Thr Phe Glu
 435 440 445
 Ile Lys Gly Leu Ala Tyr Ala Val Asp Ala Asn Ala Glu Gly Thr Ala
 450 455 460
 Val Thr Tyr Lys Leu Lys Glu Thr Lys Ala Pro Glu Gly Tyr Val Ile
 465 470 475 480
 Pro Asp Lys Glu Ile Glu Phe Thr Val Ser Gln Thr Ser Tyr Asn Thr
 485 490 495
 Lys Pro Thr Asp Ile Thr Val Asp Ser Ala Asp Ala Thr Pro Asp Thr
 500 505 510
 Ile Lys Asn Asn Lys Arg Pro Ser
 515 520

<210> 7
 <211> 483
 <212> PRT
 <213> Streptococcus agalactiae

<400> 7
 Ala Glu Val Ser Gln Glu Arg Pro Ala Lys Thr Thr Val Asn Ile Tyr
 1 5 10 15
 Lys Leu Gln Ala Asp Ser Tyr Lys Ser Glu Ile Thr Ser Asn Gly Gly
 20 25 30
 Ile Glu Asn Lys Asp Gly Glu Val Ile Ser Asn Tyr Ala Lys Leu Gly
 35 40 45
 Asp Asn Val Lys Gly Leu Gln Gly Val Gln Phe Lys Arg Tyr Lys Val
 50 55 60

Lys Thr Asp Ile Ser Val Asp Glu Leu Lys Lys Leu Thr Thr Val Glu
 65 70 80
 Ala Ala Asp Ala Lys Val Gly Thr Ile Leu Glu Glu Gly Val Ser Leu
 85 90 95
 Pro Gln Lys Thr Asn Ala Gln Gly Leu Val Val Asp Ala Leu Asp Ser
 100 105 110
 Lys Ser Asn Val Arg Tyr Leu Tyr Val Glu Asp Leu Lys Asn Ser Pro
 115 120 125
 Ser Asn Ile Thr Lys Ala Tyr Ala Val Pro Phe Val Leu Glu Leu Pro
 130 135 140
 Val Ala Asn Ser Thr Gly Thr Gly Phe Leu Ser Glu Ile Asn Ile Tyr
 145 150 155 160
 Pro Lys Asn Val Val Thr Asp Glu Pro Lys Thr Asp Lys Asp Val Lys
 165 170 175
 Lys Leu Gly Gln Asp Asp Ala Gly Tyr Thr Ile Gly Glu Glu Phe Lys
 180 185 190
 Trp Phe Leu Lys Ser Thr Ile Pro Ala Asn Leu Gly Asp Tyr Glu Lys
 195 200 205
 Phe Glu Ile Thr Asp Lys Phe Ala Asp Gly Leu Thr Tyr Lys Ser Val
 210 215 220
 Gly Lys Ile Lys Ile Gly Ser Lys Thr Leu Asn Arg Asp Glu His Tyr
 225 230 235 240
 Thr Ile Asp Glu Pro Thr Val Asp Asn Gln Asn Thr Leu Lys Ile Thr
 245 250 255
 Phe Lys Pro Glu Lys Phe Lys Glu Ile Ala Glu Leu Leu Lys Gly Met
 260 265 270
 Thr Leu Val Lys Asn Gln Asp Ala Leu Asp Lys Ala Thr Ala Asn Thr
 275 280 285
 Asp Asp Ala Ala Phe Leu Glu Ile Pro Val Ala Ser Thr Ile Asn Glu
 290 295 300
 Lys Ala Val Leu Gly Lys Ala Ile Glu Asn Thr Phe Glu Leu Gln Tyr
 305 310 315 320
 Asp His Thr Pro Asp Lys Ala Asp Asn Pro Lys Pro Ser Asn Pro Pro
 325 330 335
 Arg Lys Pro Glu Val His Thr Gly Gly Lys Arg Phe Val Lys Lys Asp
 340 345 350
 Ser Thr Glu Thr Gln Thr Leu Gly Gly Ala Glu Phe Asp Leu Leu Ala
 355 360 365
 Ser Asp Gly Thr Ala Val Lys Trp Thr Asp Ala Leu Ile Lys Ala Asn
 370 375 380
 Thr Asn Lys Asn Tyr Ile Ala Gly Glu Ala Val Thr Gly Gln Pro Ile
 385 390 395 400
 Lys Leu Lys Ser His Thr Asp Gly Thr Phe Glu Ile Lys Gly Leu Ala
 405 410 415
 Tyr Ala Val Asp Ala Asn Ala Glu Gly Thr Ala Val Thr Tyr Lys Leu
 420 425 430
 Lys Glu Thr Lys Ala Pro Glu Gly Tyr Val Ile Pro Asp Lys Glu Ile
 435 440 445
 Glu Phe Thr Val Ser Gln Thr Ser Tyr Asn Thr Lys Pro Thr Asp Ile
 450 455 460
 Thr Val Asp Ser Ala Asp Ala Thr Pro Asp Thr Ile Lys Asn Asn Lys
 465 470 475 480
 Arg Pro Ser

<210> 8
 <211> 271
 <212> PRT
 <213> Streptococcus agalactiae

<400> 8
 Ala Glu Val Ser Gln Glu Arg Pro Ala Lys Thr Thr Val Asn Ile Tyr
 1 5 10 15
 Lys Leu Gln Ala Asp Ser Tyr Lys Ser Glu Ile Thr Ser Asn Gly Gly
 20 25 30
 Ile Glu Asn Lys Asp Gly Glu Val Ile Ser Asn Tyr Ala Lys Leu Gly
 35 40 45
 Asp Asn Val Lys Gly Leu Gln Gly Val Gln Phe Lys Arg Tyr Lys Val
 50 55 60
 Lys Thr Asp Ile Ser Val Asp Glu Leu Lys Lys Leu Thr Thr Val Glu
 65 70 75 80
 Ala Ala Asp Ala Lys Val Gly Thr Ile Leu Glu Glu Gly Val Ser Leu
 85 90 95
 Pro Gln Lys Thr Asn Ala Gln Gly Leu Val Val Asp Ala Leu Asp Ser
 100 105 110
 Lys Ser Asn Val Arg Tyr Leu Tyr Val Glu Asp Leu Lys Asn Ser Pro
 115 120 125
 Ser Asn Ile Thr Lys Ala Tyr Ala Val Pro Phe Val Leu Glu Leu Pro
 130 135 140
 Val Ala Asn Ser Thr Gly Thr Gly Phe Leu Ser Glu Ile Asn Ile Tyr
 145 150 155 160
 Pro Lys Asn Val Val Thr Asp Glu Pro Lys Thr Asp Lys Asp Val Lys
 165 170 175
 Lys Leu Gly Gln Asp Asp Ala Gly Tyr Thr Ile Gly Glu Glu Phe Lys
 180 185 190
 Trp Phe Leu Lys Ser Thr Ile Pro Ala Asn Leu Gly Asp Tyr Glu Lys
 195 200 205
 Phe Glu Ile Thr Asp Lys Phe Ala Asp Gly Leu Thr Tyr Lys Ser Val
 210 215 220
 Gly Lys Ile Lys Ile Gly Ser Lys Thr Leu Asn Arg Asp Glu His Tyr
 225 230 235 240
 Thr Ile Asp Glu Pro Thr Val Asp Asn Gln Asn Thr Leu Lys Ile Thr
 245 250 255
 Phe Lys Pro Glu Lys Phe Lys Glu Ile Ala Glu Leu Leu Lys Gly
 260 265 270

<210> 9
 <211> 212
 <212> PRT
 <213> Streptococcus agalactiae

<400> 9
 Met Thr Leu Val Lys Asn Gln Asp Ala Leu Asp Lys Ala Thr Ala Asn
 1 5 10 15
 Thr Asp Asp Ala Ala Phe Leu Glu Ile Pro Val Ala Ser Thr Ile Asn
 20 25 30
 Glu Lys Ala Val Leu Gly Lys Ala Ile Glu Asn Thr Phe Glu Leu Gln
 35 40 45
 Tyr Asp His Thr Pro Asp Lys Ala Asp Asn Pro Lys Pro Ser Asn Pro

50					55					60					
Pro	Arg	Lys	Pro	Glu	Val	His	Thr	Gly	Gly	Lys	Arg	Phe	Val	Lys	Lys
65				70						75				80	
Asp	Ser	Thr	Glu	Thr	Gln	Thr	Leu	Gly	Gly	Ala	Glu	Phe	Asp	Leu	Leu
			85					90						95	
Ala	Ser	Asp	Gly	Thr	Ala	Val	Lys	Trp	Thr	Asp	Ala	Leu	Ile	Lys	Ala
			100					105					110		
Asn	Thr	Asn	Lys	Asn	Tyr	Ile	Ala	Gly	Glu	Ala	Val	Thr	Gly	Gln	Pro
		115					120					125			
Ile	Lys	Leu	Lys	Ser	His	Thr	Asp	Gly	Thr	Phe	Glu	Ile	Lys	Gly	Leu
	130					135					140				
Ala	Tyr	Ala	Val	Asp	Ala	Asn	Ala	Glu	Gly	Thr	Ala	Val	Thr	Tyr	Lys
	145				150					155				160	
Leu	Lys	Glu	Thr	Lys	Ala	Pro	Glu	Gly	Tyr	Val	Ile	Pro	Asp	Lys	Glu
			165					170						175	
Ile	Glu	Phe	Thr	Val	Ser	Gln	Thr	Ser	Tyr	Asn	Thr	Lys	Pro	Thr	Asp
		180						185					190		
Ile	Thr	Val	Asp	Ser	Ala	Asp	Ala	Thr	Pro	Asp	Thr	Ile	Lys	Asn	Asn
	195					200						205			
Lys	Arg	Pro	Ser												
	210														

<210> 10

<211> 1629

<212> DNA

<213> Streptococcus agalactiae

<400> 10

atgaaaaaag	gacaagtaaa	tgatactaag	caatcttact	ctctacgtaa	atataaaattt	60
ggtttagcat	cagtaatttt	agggtcattc	ataatggta	caagtcctgt	ttttgccgat	120
caaactacat	cggttcaagt	taataatcag	acaggcacta	gtgtggatgc	taataattct	180
tccaatgaga	caagtcgctc	aagtggtgatt	acttccaata	atgatagtgt	tcaagcgtct	240
gataaaattg	taaatagtca	aaatacggca	acaaaggaca	ttactactcc	tttagtagag	300
acaaagccaa	tggtggaaaa	aacattacct	gaacaaggga	attatgttta	tagcaaaaga	360
accgaggtga	aaaatacacc	ttcaaaatca	gccccagtag	ctttctatgc	aagaaaaggt	420
gataaagttt	ttctatgacca	agtattttaa	aaagataatg	tgaaaatggat	ttcatataag	480
tccttttttg	gcgtacgcgt	atcgcagcgt	attgagtcac	tagatccatc	aggaggttca	540
gagactaagg	cacctactcc	tgtaacaaat	tcaggaagca	ataatcaaga	gaaaatagca	600
acgcaaggaa	attatacatt	ttcacataaa	gtagaagtaa	aaaatgaagc	taaggtagcg	660
agtccaactc	aattttacatt	ggacaaaagg	gacagaattt	tttacgacca	aatactaagt	720
attgaaggaa	atcagtggtt	atcttataaa	tcattcaatg	gtgttcgtcg	ttttgttttg	780
ctaggttaag	catcttcagt	agaaaaaact	gaagataaag	aaaaagtgtc	tcctcaacca	840
caagcccgta	ttactaaaac	tggtagactg	actattttcta	acgaaaacaac	tacaggtttt	900
gatattttaa	ttacgaaat	taaagatgat	aacggtatcg	ctgctgttaa	ggtaccgggt	960
tggaactgaac	agggaaggca	agatgatatt	aaatggtata	cagctgtaac	actcggggat	1020
ggcaactaca	aagtagctgt	atcatittgt	gaccataaga	atgagaaggg	tccttataat	1080
attcatttat	actaccaaga	agctagtggt	acacttgtag	gtgtaacagg	aactaaaagt	1140
acagtagctg	gaactaattc	ttctcaagaa	cctattgaaa	atggttttagc	aaagactggt	1200
gtttataata	ttatcggaag	tactgaagta	aaaaatgaag	ctaaaaatc	aagtcagacc	1260
caattttact	tagaaaaagg	tgacaaaaata	aattatgac	aaagtattgc	acgcatgtgt	1320
taccagtgga	tttcttacia	atcttatagt	ggtgttcgtc	gctattattc	tgtgaaaaag	1380
ctaactacaa	gtagtgaaaa	agcgaaaagt	gaggcgacta	aaccgagact	ttatcccaac	1440
ttacctaata	caggtaccta	tacattttact	aaaactgtag	atgtgaaaag	tcaacctaaa	1500
gtatcaagtc	cagtggaatt	taattttcaa	aagggtgaaa	aaatacatta	tgatcaagtg	1560
ttagtagtag	atggtcatca	gtggatttca	tacaagaggt	attccggtat	tcgtcgctat	1620

attgaaatt

1629

<210> 11

<211> 543

<212> PRT

<213> Streptococcus agalactiae

<400> 11

```

Met Lys Lys Gly Gln Val Asn Asp Thr Lys Gln Ser Tyr Ser Leu Arg
 1          5          10          15
Lys Tyr Lys Phe Gly Leu Ala Ser Val Ile Leu Gly Ser Phe Ile Met
 20          25          30
Val Thr Ser Pro Val Phe Ala Asp Gln Thr Thr Ser Val Gln Val Asn
 35          40          45
Asn Gln Thr Gly Thr Ser Val Asp Ala Asn Asn Ser Ser Asn Glu Thr
 50          55          60
Ser Ala Ser Ser Val Ile Thr Ser Asn Asn Asp Ser Val Gln Ala Ser
 65          70          75          80
Asp Lys Val Val Asn Ser Gln Asn Thr Ala Thr Lys Asp Ile Thr Thr
 85          90          95
Pro Leu Val Glu Thr Lys Pro Met Val Glu Lys Thr Leu Pro Glu Gln
100          105          110
Gly Asn Tyr Val Tyr Ser Lys Glu Thr Glu Val Lys Asn Thr Pro Ser
115          120          125
Lys Ser Ala Pro Val Ala Phe Tyr Ala Lys Lys Gly Asp Lys Val Phe
130          135          140
Tyr Asp Gln Val Phe Asn Lys Asp Asn Val Lys Trp Ile Ser Tyr Lys
145          150          155          160
Ser Phe Cys Gly Val Arg Arg Tyr Ala Ala Ile Glu Ser Leu Asp Pro
165          170          175
Ser Gly Gly Ser Glu Thr Lys Ala Pro Thr Pro Val Thr Asn Ser Gly
180          185          190
Ser Asn Asn Gln Glu Lys Ile Ala Thr Gln Gly Asn Tyr Thr Phe Ser
195          200          205
His Lys Val Glu Val Lys Asn Glu Ala Lys Val Ala Ser Pro Thr Gln
210          215          220
Phe Thr Leu Asp Lys Gly Asp Arg Ile Phe Tyr Asp Gln Ile Leu Thr
225          230          235          240
Ile Glu Gly Asn Gln Trp Leu Ser Tyr Lys Ser Phe Asn Gly Val Arg
245          250          255
Arg Phe Val Leu Leu Gly Lys Ala Ser Ser Val Glu Lys Thr Glu Asp
260          265          270
Lys Glu Lys Val Ser Pro Gln Pro Gln Ala Arg Ile Thr Lys Thr Gly
275          280          285
Arg Leu Thr Ile Ser Asn Glu Thr Thr Thr Gly Phe Asp Ile Leu Ile
290          295          300
Thr Asn Ile Lys Asp Asp Asn Gly Ile Ala Ala Val Lys Val Pro Val
305          310          315          320
Trp Thr Glu Gln Gly Gly Gln Asp Asp Ile Lys Trp Tyr Thr Ala Val
325          330          335
Thr Thr Gly Asp Gly Asn Tyr Lys Val Ala Val Ser Phe Ala Asp His
340          345          350          355
Lys Asn Glu Lys Gly Leu Tyr Asn Ile His Leu Tyr Tyr Gln Glu Ala
360          365
Ser Gly Thr Leu Val Gly Val Thr Gly Thr Lys Val Thr Val Ala Gly

```

370					375					380					
Thr	Asn	Ser	Ser	Gln	Glu	Pro	Ile	Glu	Asn	Gly	Leu	Ala	Lys	Thr	Gly
385					390					395				400	
Val	Tyr	Asn	Ile	Ile	Gly	Ser	Thr	Glu	Val	Lys	Asn	Glu	Ala	Lys	Ile
				405					410					415	
Ser	Ser	Gln	Thr	Gln	Phe	Thr	Leu	Glu	Lys	Gly	Asp	Lys	Ile	Asn	Tyr
			420					425					430		
Asp	Gln	Val	Leu	Thr	Ala	Asp	Gly	Tyr	Gln	Trp	Ile	Ser	Tyr	Lys	Ser
		435					440					445			
Tyr	Ser	Gly	Val	Arg	Arg	Tyr	Ile	Pro	Val	Lys	Lys	Leu	Thr	Thr	Ser
	450					455					460				
Ser	Glu	Lys	Ala	Lys	Asp	Glu	Ala	Thr	Lys	Pro	Thr	Ser	Tyr	Pro	Asn
465					470					475				480	
Leu	Pro	Lys	Thr	Gly	Thr	Tyr	Thr	Phe	Thr	Lys	Thr	Val	Asp	Val	Lys
				485				490					495		
Ser	Gln	Pro	Lys	Val	Ser	Ser	Pro	Val	Glu	Phe	Asn	Phe	Gln	Lys	Gly
		500						505				510			
Glu	Lys	Ile	His	Tyr	Asp	Gln	Val	Leu	Val	Val	Asp	Gly	His	Gln	Trp
	515					520					525				
Ile	Ser	Tyr	Lys	Ser	Tyr	Ser	Gly	Ile	Arg	Arg	Tyr	Ile	Glu	Ile	
	530					535					540				

<210> 12

<211> 504

<212> PRT

<213> Streptococcus agalactiae

<400> 12

Asp	Gln	Thr	Thr	Ser	Val	Gln	Val	Asn	Asn	Gln	Thr	Gly	Thr	Ser	Val
1				5				10						15	
Asp	Ala	Asn	Asn	Ser	Ser	Asn	Glu	Thr	Ser	Ala	Ser	Ser	Val	Ile	Thr
		20						25				30			
Ser	Asn	Asn	Asp	Ser	Val	Gln	Ala	Ser	Asp	Lys	Val	Val	Asn	Ser	Gln
		35				40						45			
Asn	Thr	Ala	Thr	Lys	Asp	Ile	Thr	Thr	Pro	Leu	Val	Glu	Thr	Lys	Pro
	50				55					60					
Met	Val	Glu	Lys	Thr	Leu	Pro	Glu	Gln	Gly	Asn	Tyr	Val	Tyr	Ser	Lys
65				70					75					80	
Glu	Thr	Glu	Val	Lys	Asn	Thr	Pro	Ser	Lys	Ser	Ala	Pro	Val	Ala	Phe
			85						90				95		
Tyr	Ala	Lys	Lys	Gly	Asp	Lys	Val	Phe	Tyr	Asp	Gln	Val	Phe	Asn	Lys
		100						105					110		
Asp	Asn	Val	Lys	Trp	Ile	Ser	Tyr	Lys	Ser	Phe	Cys	Gly	Val	Arg	Arg
	115					120					125				
Tyr	Ala	Ala	Ile	Glu	Ser	Leu	Asp	Pro	Ser	Gly	Gly	Ser	Glu	Thr	Lys
	130				135						140				
Ala	Pro	Thr	Pro	Val	Thr	Asn	Ser	Gly	Ser	Asn	Asn	Gln	Glu	Lys	Ile
145				150					155					160	
Ala	Thr	Gln	Gly	Asn	Tyr	Thr	Phe	Ser	His	Lys	Val	Glu	Val	Lys	Asn
			165						170					175	
Glu	Ala	Lys	Val	Ala	Ser	Pro	Thr	Gln	Phe	Thr	Leu	Asp	Lys	Gly	Asp
		180						185					190		
Arg	Ile	Phe	Tyr	Asp	Gln	Ile	Leu	Thr	Ile	Glu	Gly	Asn	Gln	Trp	Leu
	195					200					205				
Ser	Tyr	Lys	Ser	Phe	Asn	Gly	Val	Arg	Arg	Phe	Val	Leu	Leu	Gly	Lys

210 215 220
 Ala Ser Ser Val Glu Lys Thr Glu Asp Lys Glu Lys Val Ser Pro Gln
 225 230 235 240
 Pro Gln Ala Arg Ile Thr Lys Thr Gly Arg Leu Thr Ile Ser Asn Glu
 245 250 255
 Thr Thr Thr Gly Phe Asp Ile Leu Ile Thr Asn Ile Lys Asp Asp Asn
 260 265 270
 Gly Ile Ala Ala Val Lys Val Pro Val Trp Thr Glu Gln Gly Gly Gln
 275 280 285
 Asp Asp Ile Lys Trp Tyr Thr Ala Val Thr Thr Gly Asp Gly Asn Tyr
 290 295 300
 Lys Val Ala Val Ser Phe Ala Asp His Lys Asn Glu Lys Gly Leu Tyr
 305 310 315 320
 Asn Ile His Leu Tyr Tyr Gln Glu Ala Ser Gly Thr Leu Val Gly Val
 325 330 335
 Thr Gly Thr Lys Val Thr Val Ala Gly Thr Asn Ser Ser Gln Glu Pro
 340 345 350
 Ile Glu Asn Gly Leu Ala Lys Thr Gly Val Tyr Asn Ile Ile Gly Ser
 355 360 365
 Thr Glu Val Lys Asn Glu Ala Lys Ile Ser Ser Gln Thr Gln Phe Thr
 370 375 380
 Leu Glu Lys Gly Asp Lys Ile Asn Tyr Asp Gln Val Leu Thr Ala Asp
 385 390 395 400
 Gly Tyr Gln Trp Ile Ser Tyr Lys Ser Tyr Ser Gly Val Arg Arg Tyr
 405 410 415
 Ile Pro Val Lys Lys Leu Thr Thr Ser Ser Glu Lys Ala Lys Asp Glu
 420 425 430
 Ala Thr Lys Pro Thr Ser Tyr Pro Asn Leu Pro Lys Thr Gly Thr Tyr
 435 440 445
 Thr Phe Thr Lys Thr Val Asp Val Lys Ser Gln Pro Lys Val Ser Ser
 450 455 460
 Pro Val Glu Phe Asn Phe Gln Lys Gly Glu Lys Ile His Tyr Asp Gln
 465 470 475 480
 Val Leu Val Val Asp Gly His Gln Trp Ile Ser Tyr Lys Ser Tyr Ser
 485 490 495
 Gly Ile Arg Arg Tyr Ile Glu Ile
 500

<210> 13

<211> 485

<212> PRT

<213> Streptococcus agalactiae

<400> 13

Met Lys Lys Gly Gln Val Asn Asp Thr Lys Gln Ser Tyr Ser Leu Arg
 1 5 10 15
 Lys Tyr Lys Phe Gly Leu Ala Ser Val Ile Leu Gly Ser Phe Ile Met
 20 25 30
 Val Thr Ser Pro Val Phe Ala Asp Gln Thr Thr Ser Val Gln Val Asn
 35 40 45
 Asn Gln Thr Gly Thr Ser Val Asp Ala Asn Asn Ser Ser Asn Glu Thr
 50 55 60
 Ser Ala Ser Ser Val Ile Thr Ser Asn Asn Asp Ser Val Gln Ala Ser
 65 70 75 80
 Asp Lys Val Val Asn Ser Gln Asn Thr Ala Thr Lys Asp Ile Thr Thr

<213> Streptococcus agalactiae

<400> 14

Leu Thr Lys Thr Gly
1 5

<210> 15

<211> 480

<212> PRT

<213> Streptococcus agalactiae

<400> 15

Met Lys Lys Gly Gln Val Asn Asp Thr Lys Gln Ser Tyr Ser Leu Arg
1 5 10 15
Lys Tyr Lys Phe Gly Leu Ala Ser Val Ile Leu Gly Ser Phe Ile Met
20 25 30
Val Thr Ser Pro Val Phe Ala Asp Gln Thr Thr Ser Val Gln Val Asn
35 40 45
Asn Gln Thr Gly Thr Ser Val Asp Ala Asn Asn Ser Ser Asn Glu Thr
50 55 60
Ser Ala Ser Ser Val Ile Thr Ser Asn Asn Asp Ser Val Gln Ala Ser
65 70 75 80
Asp Lys Val Val Asn Ser Gln Asn Thr Ala Thr Lys Asp Ile Thr Thr
85 90 95
Pro Leu Val Glu Thr Lys Pro Met Val Glu Lys Thr Leu Pro Glu Gln
100 105 110
Gly Asn Tyr Val Tyr Ser Lys Glu Thr Glu Val Lys Asn Thr Pro Ser
115 120 125
Lys Ser Ala Pro Val Ala Phe Tyr Ala Lys Lys Gly Asp Lys Val Phe
130 135 140
Tyr Asp Gln Val Phe Asn Lys Asp Asn Val Lys Trp Ile Ser Tyr Lys
145 150 155 160
Ser Phe Cys Gly Val Arg Arg Tyr Ala Ala Ile Glu Ser Leu Asp Pro
165 170 175
Ser Gly Gly Ser Glu Thr Lys Ala Pro Thr Pro Val Thr Asn Ser Gly
180 185 190
Ser Asn Asn Gln Glu Lys Ile Ala Thr Gln Gly Asn Tyr Thr Phe Ser
195 200 205
His Lys Val Glu Val Lys Asn Glu Ala Lys Val Ala Ser Pro Thr Gln
210 215 220
Phe Thr Leu Asp Lys Gly Asp Arg Ile Phe Tyr Asp Gln Ile Leu Thr
225 230 235 240
Ile Glu Gly Asn Gln Trp Leu Ser Tyr Lys Ser Phe Asn Gly Val Arg
245 250 255
Arg Phe Val Leu Leu Gly Lys Ala Ser Ser Val Glu Lys Thr Glu Asp
260 265 270
Lys Glu Lys Val Ser Pro Gln Pro Gln Ala Arg Ile Thr Lys Thr Gly
275 280 285
Arg Leu Thr Ile Ser Asn Glu Thr Thr Thr Gly Phe Asp Ile Leu Ile
290 295 300
Thr Asn Ile Lys Asp Asp Asn Gly Ile Ala Ala Val Lys Val Pro Val
305 310 315 320
Trp Thr Glu Gln Gly Gly Gln Asp Asp Ile Lys Trp Tyr Thr Ala Val
325 330 335
Thr Thr Gly Asp Gly Asn Tyr Lys Val Ala Val Ser Phe Ala Asp His

340 345 350
 Lys Asn Glu Lys Gly Leu Tyr Asn Ile His Leu Tyr Tyr Gln Glu Ala
 355 360 365
 Ser Gly Thr Leu Val Gly Val Thr Gly Thr Lys Val Thr Val Ala Gly
 370 375 380
 Thr Asn Ser Ser Gln Glu Pro Ile Glu Asn Gly Leu Ala Lys Thr Gly
 385 390 395 400
 Val Tyr Asn Ile Ile Gly Ser Thr Glu Val Lys Asn Glu Ala Lys Ile
 405 410 415
 Ser Ser Gln Thr Gln Phe Thr Leu Glu Lys Gly Asp Lys Ile Asn Tyr
 420 425 430
 Asp Gln Val Leu Thr Ala Asp Gly Tyr Gln Trp Ile Ser Tyr Lys Ser
 435 440 445
 Tyr Ser Gly Val Arg Arg Tyr Ile Pro Val Lys Lys Leu Thr Thr Ser
 450 455 460
 Ser Glu Lys Ala Lys Asp Glu Ala Thr Lys Pro Thr Ser Tyr Pro Asn
 465 470 475 480

<210> 16
 <211> 446
 <212> PRT
 <213> Streptococcus agalactiae

<400> 16
 Asp Gln Thr Thr Ser Val Gln Val Asn Asn Gln Thr Gly Thr Ser Val
 1 5 10 15
 Asp Ala Asn Asn Ser Ser Asn Glu Thr Ser Ala Ser Ser Val Ile Thr
 20 25 30
 Ser Asn Asn Asp Ser Val Gln Ala Ser Asp Lys Val Val Asn Ser Gln
 35 40 45
 Asn Thr Ala Thr Lys Asp Ile Thr Thr Pro Leu Val Glu Thr Lys Pro
 50 55 60
 Met Val Glu Lys Thr Leu Pro Glu Gln Gly Asn Tyr Val Tyr Ser Lys
 65 70 75 80
 Glu Thr Glu Val Lys Asn Thr Pro Ser Lys Ser Ala Pro Val Ala Phe
 85 90 95
 Tyr Ala Lys Lys Gly Asp Lys Val Phe Tyr Asp Gln Val Phe Asn Lys
 100 105 110
 Asp Asn Val Lys Trp Ile Ser Tyr Lys Ser Phe Cys Gly Val Arg Arg
 115 120 125
 Tyr Ala Ala Ile Glu Ser Leu Asp Pro Ser Gly Gly Ser Glu Thr Lys
 130 135 140
 Ala Pro Thr Pro Val Thr Asn Ser Gly Ser Asn Asn Gln Glu Lys Ile
 145 150 155 160
 Ala Thr Gln Gly Asn Tyr Thr Phe Ser His Lys Val Glu Val Lys Asn
 165 170 175
 Glu Ala Lys Val Ala Ser Pro Thr Gln Phe Thr Leu Asp Lys Gly Asp
 180 185 190
 Arg Ile Phe Tyr Asp Gln Ile Leu Thr Ile Glu Gly Asn Gln Trp Leu
 195 200 205
 Ser Tyr Lys Ser Phe Asn Gly Val Arg Arg Phe Val Leu Leu Gly Lys
 210 215 220
 Ala Ser Ser Val Glu Lys Thr Glu Asp Lys Glu Lys Val Ser Pro Gln

225					230					235				240
Pro	Gln	Ala	Arg	Ile	Thr	Lys	Thr	Gly	Arg	Leu	Thr	Ile	Ser	Asn
				245					250					255
Thr	Thr	Thr	Gly	Phe	Asp	Ile	Leu	Ile	Thr	Asn	Ile	Lys	Asp	Asp
			260					265					270	
Gly	Ile	Ala	Ala	Val	Lys	Val	Pro	Val	Trp	Thr	Glu	Gln	Gly	Gln
		275					280				285			
Asp	Asp	Ile	Lys	Trp	Tyr	Thr	Ala	Val	Thr	Thr	Gly	Asp	Gly	Tyr
	290				295					300				
Lys	Val	Ala	Val	Ser	Phe	Ala	Asp	His	Lys	Asn	Glu	Lys	Gly	Leu
305					310					315				320
Asn	Ile	His	Leu	Tyr	Gln	Glu	Ala	Ser	Gly	Thr	Leu	Val	Gly	Val
			325					330					335	
Thr	Gly	Thr	Lys	Val	Thr	Val	Ala	Gly	Thr	Asn	Ser	Ser	Gln	Glu
			340					345					350	
Ile	Glu	Asn	Gly	Leu	Ala	Lys	Thr	Gly	Val	Tyr	Asn	Ile	Ile	Gly
		355					360					365		
Thr	Glu	Val	Lys	Asn	Glu	Ala	Lys	Ile	Ser	Ser	Gln	Thr	Gln	Phe
		370					375				380			
Leu	Glu	Lys	Gly	Asp	Lys	Ile	Asn	Tyr	Asp	Gln	Val	Leu	Thr	Ala
385					390					395				400
Gly	Tyr	Gln	Trp	Ile	Ser	Tyr	Lys	Ser	Tyr	Ser	Gly	Val	Arg	Arg
			405					410					415	
Ile	Pro	Val	Lys	Lys	Leu	Thr	Thr	Ser	Ser	Glu	Lys	Ala	Lys	Asp
			420					425					430	
Ala	Thr	Lys	Pro	Thr	Ser	Tyr	Pro	Asn	Leu	Pro	Lys	Thr	Gly	
		435					440					445		

<210> 17

<211> 441

<212> PRT

<213> Streptococcus agalactiae

<400> 17

Asp	Gln	Thr	Thr	Ser	Val	Gln	Val	Asn	Asn	Gln	Thr	Gly	Thr	Ser	Val
1				5				10						15	
Asp	Ala	Asn	Asn	Ser	Ser	Asn	Glu	Thr	Ser	Ala	Ser	Ser	Val	Ile	Thr
		20						25					30		
Ser	Asn	Asn	Asp	Ser	Val	Gln	Ala	Ser	Asp	Lys	Val	Val	Asn	Ser	Gln
		35					40					45			
Asn	Thr	Ala	Thr	Lys	Asp	Ile	Thr	Thr	Pro	Leu	Val	Glu	Thr	Lys	Pro
		50				55				60					
Met	Val	Glu	Lys	Thr	Leu	Pro	Glu	Gln	Gly	Asn	Tyr	Val	Tyr	Ser	Lys
65					70					75				80	
Glu	Thr	Glu	Val	Lys	Asn	Thr	Pro	Ser	Lys	Ser	Ala	Pro	Val	Ala	Phe
			85					90					95		
Tyr	Ala	Lys	Lys	Gly	Asp	Lys	Val	Phe	Tyr	Asp	Gln	Val	Phe	Asn	Lys
		100						105					110		
Asp	Asn	Val	Lys	Trp	Ile	Ser	Tyr	Lys	Ser	Phe	Cys	Gly	Val	Arg	Arg
		115					120					125			
Tyr	Ala	Ala	Ile	Glu	Ser	Leu	Asp	Pro	Ser	Gly	Gly	Ser	Glu	Thr	Lys
		130				135					140				
Ala	Pro	Thr	Pro	Val	Thr	Asn	Ser	Gly	Ser	Asn	Asn	Gln	Glu	Lys	Ile
145				150						155				160	

Ala Thr Gln Gly Asn Tyr Thr Phe Ser His Lys Val Glu Val Lys Asn
165 170 175
Glu Ala Lys Val Ala Ser Pro Thr Gln Phe Thr Leu Asp Lys Gly Asp
180 185 190
Arg Ile Phe Tyr Asp Gln Ile Leu Thr Ile Glu Gly Asn Gln Trp Leu
195 200 205
Ser Tyr Lys Ser Phe Asn Gly Val Arg Arg Phe Val Leu Leu Gly Lys
210 215 220
Ala Ser Ser Val Glu Lys Thr Glu Asp Lys Glu Lys Val Ser Pro Gln
225 230 235 240
Pro Gln Ala Arg Ile Thr Lys Thr Gly Arg Leu Thr Ile Ser Asn Glu
245 250 255
Thr Thr Thr Gly Phe Asp Ile Leu Ile Thr Asn Ile Lys Asp Asp Asn
260 265 270
Gly Ile Ala Ala Val Lys Val Pro Val Trp Thr Glu Gln Gly Gly Gln
275 280 285
Asp Asp Ile Lys Trp Tyr Thr Ala Val Thr Thr Gly Asp Gly Asn Tyr
290 295 300
Lys Val Ala Val Ser Phe Ala Asp His Lys Asn Glu Lys Gly Leu Tyr
305 310 315 320
Asn Ile His Leu Tyr Tyr Gln Glu Ala Ser Gly Thr Leu Val Gly Val
325 330 335
Thr Gly Thr Lys Val Thr Val Ala Gly Thr Asn Ser Ser Gln Glu Pro
340 345 350
Ile Glu Asn Gly Leu Ala Lys Thr Gly Val Tyr Asn Ile Ile Gly Ser
355 360 365
Thr Glu Val Lys Asn Glu Ala Lys Ile Ser Ser Gln Thr Gln Phe Thr
370 375 380
Leu Glu Lys Gly Asp Lys Ile Asn Tyr Asp Gln Val Leu Thr Ala Asp
385 390 395 400
Gly Tyr Gln Trp Ile Ser Tyr Lys Ser Tyr Ser Gly Val Arg Arg Tyr
405 410 415
Ile Pro Val Lys Lys Leu Thr Thr Ser Ser Glu Lys Ala Lys Asp Glu
420 425 430
Ala Thr Lys Pro Thr Ser Tyr Pro Asn
435 440

<210> 18
<211> 2670
<212> DNA
<213> Streptococcus agalactiae

<400> 18
atgaaaaaga gacaaaaaat atggagaggg ttatcagtta ctttactaat cctgtcccaa 60
attccatttg gtatatgtgt acaaggtgaa acccaagata ccaatcaagc acttggaaaa 120
gtaattgtta aaaaaacggg agacaatgct acaccattag gcaaacgac ttttgtgtta 180
aaaaatgaca atgataagtc agaaacaagt cagcaaacgg tagagggttc tggagaagca 240
acctttgaaa acataaaacc tggagactac acattaagag aagaaacagc accaattggt 300
tataaaaaaa ctgataaaac ctggaaagt aaagtgtcag ataacggagc aacaataatc 360
gagggtatgg atgcagataa agcagagaaa cgaaaagaag ttttgaatgc ccaatatcca 420
aaatcagcta tttatgagga tacaaaagaa aattacccat tagttaatgt agagggttcc 480
aaagtgtgtg aacaatacaa agcattgaat ccaataaatg gaaaagatgg tcgaagagag 540
attgtctgaag gttgtttac aaaaaaaatt acaggggtca atgatctcga taagaatgaa 600
tataaaaatt aattaaactg tgagggtaaa accactgttg aaacgaaaga acttaatcaa 660
ccactagatg tcgttgtgtc attagataat tcaaatagta tgaataatga aagagccaat 720

aattctcaaa	gagcattaaa	agctggggaa	gcagttgaaa	agctgattga	taaaattaca	780
tcaaataaag	acaatagagt	agctcttgtg	acatatgcct	caaccatttt	tgatggtact	840
gaagcgaccg	tatcaaaagg	agttgccgat	caaaatggta	aagcgctgaa	tgatagtgtg	900
tcatgggatt	atcataaaac	tactttttaca	gcaactacac	ataattacag	ttattttaat	960
ttaaacaatg	atgctaacga	agtttaattatt	ctaaagtcaa	gaattccaaa	ggaagcggag	1020
ctataaatg	gggatcgcac	gctctatcaa	tttggtcgca	catttactca	aaagctctca	1080
atgaaaacaa	atgaaatttt	agagacacaa	agttctaagt	ctagaaaaaa	acctattttt	1140
cacgttaact	atgggtgtcc	tacgatgtct	tatgccataa	atttttaatt	ttatatatca	1200
acatcttacc	aaaaccagtt	taattctttt	ttaaaataaa	taccagatga	aagtgggtatt	1260
ctccaagagg	attttataat	caatgggtgat	gattatcaaa	tagtaaaagg	agatgggagag	1320
agtttttaac	tgttttcgga	tagaaaaagt	cctgttactg	gaggaacgac	acaagcagct	1380
tatcgagtag	cgcaaaatca	actctctgta	atgagtaagt	agggatagtc	aattaatagt	1440
ggatatattt	atctctattg	gagagattac	aactgggtct	atccatttga	tcctaaagaca	1500
aagaaaagtt	ctgcaacgaa	acaaatcaaa	actcatgggt	agccaaacaac	attatacttt	1560
aatggaaaat	taagacctaa	aggttatgac	atttttactg	ttgggattgg	tgtaaacgga	1620
gatcctggta	caactcctct	tgaagctgag	aaatttatgc	aatcaaatatc	aaatataaca	1680
gaaaattata	ctaattgtga	tgaatacaat	aaaattttatg	atgagctaaa	taataacttt	1740
aaaaacaattg	ttgaggaaaa	acattctatt	gttgatggaa	atgtgactga	tcctatggga	1800
gagatgattg	aattccaatt	aaaaaatggg	caaaagtttta	cacatgatga	ttacgttttg	1860
gttggaaagt	atggcagtc	attaaaaaat	gggtgggctc	ttgggtggacc	aaacagtgat	1920
gggggaattt	taaaagatgt	tacagtgaat	tatgataaga	catctcaaac	catcaaaaatc	1980
aatcatattga	acttaggaag	tggcaaaaaa	gtagttctta	cctatgatgt	acgttttaaaa	2040
gataactata	taagtaacaa	attttacaat	acaaataatc	gtacacgcgt	gtacccggaag	2100
agtgaataag	aaccaaatac	tattcgtgat	ttcccaattc	ccaaaattcg	tgatgttcgt	2160
gagtttccgg	tactaaccat	cagtaatcag	aagaaaatgg	gtgaggttga	attattataaa	2220
gttaataaag	acaaacattc	agaatcgctt	ttgggagcta	agtttcaact	tcagatagaa	2280
aaagattttt	ctgggtataa	gcaatttgtt	ccagagggaa	gtgatgttac	acaaaaagat	2340
gatggtaaaa	tttattttaa	agcacttcaa	gatggtaact	ataaattata	tgaattttca	2400
agtcacagatg	gctatataga	ggttaaaacg	aaacctgttg	tgacatttac	aattcaaaat	2460
ggagaagtta	cgaacctgaa	acgagatcca	aatgctaata	aaaatcaaat	cggtgtactct	2520
gaaggaaatg	gtaaaacatc	tattccaac	actcccaaac	gccaccagg	tgtttttcct	2580
aaaacagggg	gaattggtag	aattgtctat	atattagttg	gttctacttt	tatgatactt	2640
accatttgtt	ctttccgctg	taaaacaattg				2670

<210> 19

<211> 890

<212> PRT

<213> Streptococcus agalactiae

<400> 19

Met	Lys	Lys	Arg	Gln	Lys	Ile	Trp	Arg	Gly	Leu	Ser	Val	Thr	Leu	Leu
1				5					10					15	
Ile	Leu	Ser	Gln	Ile	Pro	Phe	Gly	Ile	Leu	Val	Gln	Gly	Glu	Thr	Gln
			20					25					30		
Asp	Thr	Asn	Gln	Ala	Leu	Gly	Lys	Val	Ile	Val	Lys	Lys	Thr	Gly	Asp
		35					40					45			
Asn	Ala	Thr	Pro	Leu	Gly	Lys	Ala	Thr	Phe	Val	Leu	Lys	Asn	Asp	Asn
		50				55					60				
Asp	Lys	Ser	Glu	Thr	Ser	His	Glu	Thr	Val	Glu	Gly	Ser	Gly	Glu	Ala
65					70					75				80	
Thr	Phe	Glu	Asn	Ile	Lys	Pro	Gly	Asp	Thr	Thr	Leu	Arg	Glu	Gly	Thr
			85					90						95	
Ala	Pro	Ile	Gly	Tyr	Lys	Lys	Thr	Asp	Lys	Thr	Trp	Lys	Val	Lys	Val
		100						105				110			
Ala	Asp	Asn	Gly	Ala	Thr	Ile	Ile	Glu	Gly	Met	Asp	Ala	Asp	Lys	Ala

Glu 130				115				120				125							
				Lys 135	Arg	Lys	Glu	Val	Leu	Asn	Ala	Gln	Tyr	Pro	Lys	Ser	Ala	Ile	
Tyr 145				Asp	Thr	Lys	Glu	Asn	Tyr	Pro	Leu	Val	Asn	Val	Glu	Gly	Ser	160	
Lys 155				Val	Gly	Glu	Gln	Tyr	Lys	Ala	Leu	Asn	Pro	Ile	Asn	Gly	Lys	Asp	175
Gly				Arg	Arg	Glu	Ile	Ala	Glu	Gly	Trp	Leu	Ser	Lys	Lys	Ile	Thr	Gly	190
Val				Asn	Asp	Leu	Asp	Lys	Asn	Lys	Tyr	Lys	Ile	Glu	Leu	Thr	Val	Glu	205
Gly				Lys	Thr	Thr	Val	Glu	Thr	Lys	Glu	Leu	Asn	Gln	Pro	Leu	Asp	Val	220
Val				Val	Leu	Leu	Asp	Asn	Ser	Asn	Ser	Met	Asn	Asn	Glu	Arg	Ala	Asn	235
Asn				Ser	Gln	Arg	Ala	Leu	Lys	Ala	Gly	Glu	Ala	Val	Glu	Lys	Leu	Ile	250
Asp				Lys	Ile	Thr	Ser	Asn	Lys	Asp	Asn	Arg	Val	Ala	Leu	Val	Thr	Tyr	265
Ala				Ser	Thr	Ile	Phe	Asp	Gly	Thr	Glu	Ala	Thr	Val	Ser	Lys	Gly	Val	280
Ala				Asp	Gln	Asn	Gly	Lys	Ala	Leu	Asn	Asp	Ser	Val	Ser	Trp	Asp	Tyr	295
His				Lys	Thr	Thr	Phe	Thr	Ala	Thr	Thr	His	Asn	Tyr	Ser	Tyr	Leu	Asn	310
Leu				Thr	Asn	Asp	Ala	Asn	Glu	Val	Asn	Ile	Leu	Lys	Ser	Arg	Ile	Pro	325
Lys				Glu	Ala	Glu	His	Ile	Asn	Gly	Asp	Arg	Thr	Leu	Tyr	Gln	Phe	Gly	340
Ala				Thr	Phe	Thr	Gln	Lys	Ala	Leu	Met	Lys	Ala	Asn	Glu	Ile	Leu	Glu	355
Thr				Gln	Ser	Ser	Asn	Ala	Arg	Lys	Lys	Leu	Ile	Phe	His	Val	Thr	Asp	370
Gly				Val	Pro	Thr	Met	Ser	Tyr	Ala	Ile	Asn	Phe	Asn	Pro	Tyr	Ile	Ser	385
Thr				Ser	Tyr	Gln	Asn	Gln	Phe	Asn	Ser	Phe	Leu	Asn	Lys	Ile	Pro	Asp	400
Arg				Ser	Gly	Ile	Leu	Gln	Glu	Asp	Phe	Ile	Ile	Asn	Gly	Asp	Asp	Tyr	415
Gln				Ile	Val	Lys	Gly	Asp	Gly	Glu	Ser	Phe	Lys	Leu	Phe	Ser	Asp	Arg	425
Lys				Val	Pro	Val	Thr	Gly	Gly	Thr	Thr	Gln	Ala	Ala	Tyr	Arg	Val	Pro	440
Gln				Asn	Gln	Leu	Ser	Val	Met	Ser	Asn	Glu	Gly	Tyr	Ala	Ile	Asn	Ser	455
Gly				Tyr	Ile	Tyr	Leu	Tyr	Trp	Arg	Asp	Tyr	Asn	Trp	Val	Tyr	Pro	Phe	470
Asp				Pro	Lys	Thr	Lys	Lys	Val	Ser	Ala	Thr	Lys	Gln	Ile	Lys	Thr	His	485
Gly				Glu	Pro	Thr	Thr	Leu	Tyr	Phe	Asn	Gly	Asn	Ile	Arg	Pro	Lys	Gly	500
Tyr				Asp	Ile	Phe	Thr	Val	Gly	Ile	Gly	Val	Asn	Gly	Asp	Pro	Gly	Ala	515
Thr				Pro	Leu	Glu	Ala	Glu	Lys	Phe	Met	Gln	Ser	Ile	Ser	Ser	Lys	Thr	530

545 550 555 560
 Glu Asn Tyr Thr Asn Val Asp Asp Thr Asn Lys Ile Tyr Asp Glu Leu
 565 570 575
 Asn Lys Tyr Phe Lys Thr Ile Val Glu Glu Lys His Ser Ile Val Asp
 580 585 590
 Gly Asn Val Thr Asp Pro Met Gly Glu Met Ile Glu Phe Gln Leu Lys
 595 600 605
 Asn Gly Gln Ser Phe Thr His Asp Asp Tyr Val Leu Val Gly Asn Asp
 610 615 620
 Gly Ser Gln Leu Lys Asn Gly Val Ala Leu Gly Gly Pro Asn Ser Asp
 625 630 635 640
 Gly Gly Ile Leu Lys Asp Val Thr Val Thr Tyr Asp Lys Thr Ser Gln
 645 650 655
 Thr Ile Lys Ile Asn His Leu Asn Leu Gly Ser Gly Gln Lys Val Val
 660 665 670
 Leu Thr Tyr Asp Val Arg Leu Lys Asp Asn Tyr Ile Ser Asn Lys Phe
 675 680 685
 Tyr Asn Thr Asn Asn Arg Thr Thr Leu Ser Pro Lys Ser Glu Lys Glu
 690 695 700
 Pro Asn Thr Ile Arg Asp Phe Pro Ile Pro Lys Ile Arg Asp Val Arg
 705 710 715 720
 Glu Phe Pro Val Leu Thr Ile Ser Asn Gln Lys Lys Met Gly Glu Val
 725 730 735
 Glu Phe Ile Lys Val Asn Lys Asp Lys His Ser Glu Ser Leu Leu Gly
 740 745 750
 Ala Lys Phe Gln Leu Gln Ile Glu Lys Asp Phe Ser Gly Tyr Lys Gln
 755 760 765
 Phe Val Pro Glu Gly Ser Asp Val Thr Thr Lys Asn Asp Gly Lys Ile
 770 775 780
 Tyr Phe Lys Ala Leu Gln Asp Gly Asn Tyr Lys Leu Tyr Glu Ile Ser
 785 790 795 800
 Ser Pro Asp Gly Tyr Ile Glu Val Lys Thr Lys Pro Val Val Thr Phe
 805 810 815
 Thr Ile Gln Asn Gly Glu Val Thr Asn Leu Lys Ala Asp Pro Asn Ala
 820 825 830
 Asn Lys Asn Gln Ile Gly Tyr Leu Glu Gly Asn Gly Lys His Leu Ile
 835 840 845
 Thr Asn Thr Pro Lys Arg Pro Pro Gly Val Phe Pro Lys Thr Gly Gly
 850 855 860
 Ile Gly Thr Ile Val Tyr Ile Leu Val Gly Ser Thr Phe Met Ile Leu
 865 870 875 880
 Thr Ile Cys Ser Phe Arg Arg Lys Gln Leu
 885 890

<210> 20
 <211> 862
 <212> PRT
 <213> Streptococcus agalactiae

<400> 20
 Gly Glu Thr Gln Asp Thr Asn Gln Ala Leu Gly Lys Val Ile Val Lys
 1 5 10 15
 Lys Thr Gly Asp Asn Ala Thr Pro Leu Gly Lys Ala Thr Phe Val Leu
 20 25 30
 Lys Asn Asp Asn Asp Lys Ser Glu Thr Ser His Glu Thr Val Glu Gly

[illegible]

Ile Lys Thr His Gly Glu Pro Thr Thr Leu Tyr Phe Asn Gly Asn Ile
 485 490 495
 Arg Pro Lys Gly Tyr Asp Ile Phe Thr Val Gly Ile Gly Val Asn Gly
 500 505 510
 Asp Pro Gly Ala Thr Pro Leu Glu Ala Glu Lys Phe Met Gln Ser Ile
 515 520 525
 Ser Ser Lys Thr Glu Asn Tyr Thr Asn Val Asp Asp Thr Asn Lys Ile
 530 535 540
 Tyr Asp Glu Leu Asn Lys Tyr Phe Lys Thr Ile Val Glu Glu Lys His
 545 550 555 560
 Ser Ile Val Asp Gly Asn Val Thr Asp Pro Met Gly Glu Met Ile Glu
 565 570 575
 Phe Gln Leu Lys Asn Gly Gln Ser Phe Thr His Asp Asp Tyr Val Leu
 580 585 590
 Val Gly Asn Asp Gly Ser Gln Leu Lys Asn Gly Val Ala Leu Gly Gly
 595 600 605
 Pro Asn Ser Asp Gly Gly Ile Leu Lys Asp Val Thr Val Thr Tyr Asp
 610 615 620
 Lys Thr Ser Gln Thr Ile Lys Ile Asn His Leu Asn Leu Gly Ser Gly
 625 630 635 640
 Gln Lys Val Val Leu Thr Tyr Asp Val Arg Leu Lys Asp Asn Tyr Ile
 645 650 655
 Ser Asn Lys Phe Tyr Asn Thr Asn Asn Arg Thr Thr Leu Ser Pro Lys
 660 665 670
 Ser Glu Lys Glu Pro Asn Thr Ile Arg Asp Phe Pro Ile Pro Lys Ile
 675 680 685
 Arg Asp Val Arg Glu Phe Pro Val Leu Thr Ile Ser Asn Gln Lys Lys
 690 695 700
 Met Gly Glu Val Glu Phe Ile Lys Val Asn Lys Asp Lys His Ser Glu
 705 710 715 720
 Ser Leu Leu Gly Ala Lys Phe Gln Leu Gln Ile Glu Lys Asp Phe Ser
 725 730 735
 Gly Tyr Lys Gln Phe Val Pro Glu Gly Ser Asp Val Thr Thr Lys Asn
 740 745 750
 Asp Gly Lys Ile Tyr Phe Lys Ala Leu Gln Asp Gly Asn Tyr Lys Leu
 755 760 765
 Tyr Glu Ile Ser Ser Pro Asp Gly Tyr Ile Glu Val Lys Thr Lys Pro
 770 775 780
 Val Val Thr Phe Thr Ile Gln Asn Gly Glu Val Thr Asn Leu Lys Ala
 785 790 795 800
 Asp Pro Asn Ala Asn Lys Asn Gln Ile Gly Tyr Leu Glu Gly Asn Gly
 805 810 815
 Lys His Leu Ile Thr Asn Thr Pro Lys Arg Pro Pro Gly Val Phe Pro
 820 825 830
 Lys Thr Gly Gly Ile Gly Thr Ile Val Tyr Ile Leu Val Gly Ser Thr
 835 840 845
 Phe Met Ile Leu Thr Ile Cys Ser Phe Arg Arg Lys Gln Leu
 850 855 860

<210> 21
 <211> 851
 <212> PRT
 <213> Streptococcus agalactiae
 <400> 21

Met Lys Lys Arg Gln Lys Ile Trp Arg Gly Leu Ser Val Thr Leu Leu
 1 5 10 15
 Ile Leu Ser Gln Ile Pro Phe Gly Ile Leu Val Gln Gly Glu Thr Gln
 20 25 30
 Asp Thr Asn Gln Ala Leu Gly Lys Val Ile Val Lys Lys Thr Gly Asp
 35 40 45
 Asn Ala Thr Pro Leu Gly Lys Ala Thr Phe Val Leu Lys Asn Asp Asn
 50 55 60
 Asp Lys Ser Glu Thr Ser His Glu Thr Val Glu Gly Ser Gly Glu Ala
 65 70 75 80
 Thr Phe Glu Asn Ile Lys Pro Gly Asp Tyr Thr Leu Arg Glu Glu Thr
 85 90 95
 Ala Pro Ile Gly Tyr Lys Lys Thr Asp Lys Thr Trp Lys Val Lys Val
 100 105 110

 Ala Asp Asn Gly Ala Thr Ile Ile Glu Gly Met Asp Ala Asp Lys Ala
 115 120 125
 Glu Lys Arg Lys Glu Val Leu Asn Ala Gln Tyr Pro Lys Ser Ala Ile
 130 135 140
 Tyr Glu Asp Thr Lys Glu Asn Tyr Pro Leu Val Asn Val Glu Gly Ser
 145 150 155 160
 Lys Val Gly Glu Gln Tyr Lys Ala Leu Asn Pro Ile Asn Gly Lys Asp
 165 170 175
 Gly Arg Arg Glu Ile Ala Glu Gly Trp Leu Ser Lys Lys Ile Thr Gly
 180 185 190
 Val Asn Asp Leu Asp Lys Asn Lys Tyr Lys Ile Glu Leu Thr Val Glu
 195 200 205
 Gly Lys Thr Thr Val Glu Thr Lys Glu Leu Asn Gln Pro Leu Asp Val
 210 215 220
 Val Val Leu Leu Asp Asn Ser Asn Ser Met Asn Asn Glu Arg Ala Asn
 225 230 235 240
 Asn Ser Gln Arg Ala Leu Lys Ala Gly Glu Ala Val Glu Lys Leu Ile
 245 250 255
 Asp Lys Ile Thr Ser Asn Lys Asp Asn Arg Val Ala Leu Val Thr Tyr
 260 265 270
 Ala Ser Thr Ile Phe Asp Gly Thr Glu Ala Thr Val Ser Lys Gly Val
 275 280 285
 Ala Asp Gln Asn Gly Lys Ala Leu Asn Asp Ser Val Ser Trp Asp Tyr
 290 295 300
 His Lys Thr Thr Phe Thr Ala Thr Thr His Asn Tyr Ser Tyr Leu Asn
 305 310 315 320
 Leu Thr Asn Asp Ala Asn Glu Val Asn Ile Leu Lys Ser Arg Ile Pro
 325 330 335
 Lys Glu Ala Glu His Ile Asn Gly Asp Arg Thr Leu Tyr Gln Phe Gly
 340 345 350
 Ala Thr Phe Thr Gln Lys Ala Leu Met Lys Ala Asn Glu Ile Leu Glu
 355 360 365
 Thr Gln Ser Ser Asn Ala Arg Lys Lys Leu Ile Phe His Val Thr Asp
 370 375 380
 Gly Val Pro Thr Met Ser Tyr Ala Ile Asn Phe Asn Pro Tyr Ile Ser
 385 390 395 400
 Thr Ser Tyr Gln Asn Gln Phe Asn Ser Phe Leu Asn Lys Ile Pro Asp
 405 410 415
 Arg Ser Gly Ile Leu Gln Glu Asp Phe Ile Ile Asn Gly Asp Asp Tyr
 420 425 430

Gln Ile Val Lys Gly Asp Gly Glu Ser Phe Lys Leu Phe Ser Asp Arg
 435 440 445
 Lys Val Pro Val Thr Gly Gly Thr Thr Gln Ala Ala Tyr Arg Val Pro
 450 455 460
 Gln Asn Gln Leu Ser Val Met Ser Asn Glu Gly Tyr Ala Ile Asn Ser
 465 470 475 480
 Gly Tyr Ile Tyr Leu Tyr Trp Arg Asp Tyr Asn Trp Val Tyr Pro Phe
 485 490 495
 Asp Pro Lys Thr Lys Lys Val Ser Ala Thr Lys Gln Ile Lys Thr His
 500 505 510
 Gly Glu Pro Thr Thr Leu Tyr Phe Asn Gly Asn Ile Arg Pro Lys Gly
 515 520 525
 Tyr Asp Ile Phe Thr Val Gly Ile Gly Val Asn Gly Asp Pro Gly Ala
 530 535 540
 Thr Pro Leu Glu Ala Glu Lys Phe Met Gln Ser Ile Ser Ser Lys Thr
 545 550 555 560
 Glu Asn Tyr Thr Asn Val Asp Asp Thr Asn Lys Ile Tyr Asp Glu Leu
 565 570 575
 Asn Lys Tyr Phe Lys Thr Ile Val Glu Glu Lys His Ser Ile Val Asp
 580 585 590
 Gly Asn Val Thr Asp Pro Met Gly Glu Met Ile Glu Phe Gln Leu Lys
 595 600 605
 Asn Gly Gln Ser Phe Thr His Asp Asp Tyr Val Leu Val Gly Asn Asp
 610 615 620
 Gly Ser Gln Leu Lys Asn Gly Val Ala Leu Gly Gly Pro Asn Ser Asp
 625 630 635 640
 Gly Gly Ile Leu Lys Asp Val Thr Val Thr Tyr Asp Lys Thr Ser Gln
 645 650 655
 Thr Ile Lys Ile Asn His Leu Asn Leu Gly Ser Gly Gln Lys Val Val
 660 665 670
 Leu Thr Tyr Asp Val Arg Leu Lys Asp Asn Tyr Ile Ser Asn Lys Phe
 675 680 685
 Tyr Asn Thr Asn Asn Arg Thr Thr Leu Ser Pro Lys Ser Glu Lys Glu
 690 695 700
 Pro Asn Thr Ile Arg Asp Phe Pro Ile Pro Lys Ile Arg Asp Val Arg
 705 710 715 720
 Glu Phe Pro Val Leu Thr Ile Ser Asn Gln Lys Lys Met Gly Glu Val
 725 730 735
 Glu Phe Ile Lys Val Asn Lys Asp Lys His Ser Glu Ser Leu Leu Gly
 740 745 750
 Ala Lys Phe Gln Leu Gln Ile Glu Lys Asp Phe Ser Gly Tyr Lys Gln
 755 760 765
 Phe Val Pro Glu Gly Ser Asp Val Thr Thr Lys Asn Asp Gly Lys Ile
 770 775 780
 Tyr Phe Lys Ala Leu Gln Asp Gly Asn Tyr Lys Leu Tyr Glu Ile Ser
 785 790 795 800
 Ser Pro Asp Gly Tyr Ile Glu Val Lys Thr Lys Pro Val Val Thr Phe
 805 810 815
 Thr Ile Gln Asn Gly Glu Val Thr Asn Leu Lys Ala Asp Pro Asn Ala
 820 825 830
 Asn Lys Asn Gln Ile Gly Tyr Leu Glu Gly Asn Gly Lys His Leu Ile
 835 840 845
 Thr Asn Thr
 850

<210> 22
 <211> 823
 <212> PRT
 <213> Streptococcus agalactiae

<400> 22
 Gly Glu Thr Gln Asp Thr Asn Gln Ala Leu Gly Lys Val Ile Val Lys
 1 5 10 15
 Lys Thr Gly Asp Asn Ala Thr Pro Leu Gly Lys Ala Thr Phe Val Leu
 20 25 30
 Lys Asn Asp Asn Asp Lys Ser Glu Thr Ser His Glu Thr Val Glu Gly
 35 40 45
 Ser Gly Glu Ala Thr Phe Glu Asn Ile Lys Pro Gly Asp Tyr Thr Leu
 50 55 60
 Arg Glu Glu Thr Ala Pro Ile Gly Tyr Lys Lys Thr Asp Lys Thr Trp
 65 70 75 80
 Lys Val Lys Val Ala Asp Asn Gly Ala Thr Ile Ile Glu Gly Met Asp
 85 90 95
 Ala Asp Lys Ala Glu Lys Arg Lys Glu Val Leu Asn Ala Gln Tyr Pro
 100 105 110
 Lys Ser Ala Ile Tyr Glu Asp Thr Lys Glu Asn Tyr Pro Leu Val Asn
 115 120 125
 Val Glu Gly Ser Lys Val Gly Glu Gln Tyr Lys Ala Leu Asn Pro Ile
 130 135 140
 Asn Gly Lys Asp Gly Arg Arg Glu Ile Ala Glu Gly Trp Leu Ser Lys
 145 150 155 160
 Lys Ile Thr Gly Val Asn Asp Leu Asp Lys Asn Lys Tyr Lys Ile Glu
 165 170 175
 Leu Thr Val Glu Gly Lys Thr Thr Val Glu Thr Lys Glu Leu Asn Gln
 180 185 190
 Pro Leu Asp Val Val Val Leu Leu Asp Asn Ser Asn Ser Met Asn Asn
 195 200 205
 Glu Arg Ala Asn Asn Ser Gln Arg Ala Leu Lys Ala Gly Glu Ala Val
 210 215 220
 Glu Lys Leu Ile Asp Lys Ile Thr Ser Asn Lys Asp Asn Arg Val Ala
 225 230 235 240
 Leu Val Thr Tyr Ala Ser Thr Ile Phe Asp Gly Thr Glu Ala Thr Val
 245 250 255
 Ser Lys Gly Val Ala Asp Gln Asn Gly Lys Ala Leu Asn Asp Ser Val
 260 265 270
 Ser Trp Asp Tyr His Lys Thr Thr Phe Thr Ala Thr Thr His Asn Tyr
 275 280 285
 Ser Tyr Leu Asn Leu Thr Asn Asp Ala Asn Glu Val Asn Ile Leu Lys
 290 295 300
 Ser Arg Ile Pro Lys Glu Ala Glu His Ile Asn Gly Asp Arg Thr Leu
 305 310 315 320
 Tyr Gln Phe Gly Ala Thr Phe Thr Gln Lys Ala Leu Met Lys Ala Asn
 325 330 335
 Glu Ile Leu Glu Thr Gln Ser Ser Asn Ala Arg Lys Lys Leu Ile Phe
 340 345 350
 His Val Thr Asp Gly Val Pro Thr Met Ser Tyr Ala Ile Asn Phe Asn
 355 360 365
 Pro Tyr Ile Ser Thr Ser Tyr Gln Asn Gln Phe Asn Ser Phe Leu Asn

370		375		380
Lys Ile Pro Asp Arg Ser Gly Ile Leu Gln Glu Asp Phe Ile Ile Asn				
385		390		400
Gly Asp Asp Tyr Gln Ile Val Lys Gly Asp Gly Glu Ser Phe Lys Leu				
	405		410	415
Phe Ser Asp Arg Lys Val Pro Val Thr Gly Gly Thr Thr Gln Ala Ala				
	420		425	430
Tyr Arg Val Pro Gln Asn Gln Leu Ser Val Met Ser Asn Glu Gly Tyr				
	435		440	445
Ala Ile Asn Ser Gly Tyr Ile Tyr Leu Tyr Trp Arg Asp Tyr Asn Trp				
	450		455	460
Val Tyr Pro Phe Asp Pro Lys Thr Lys Lys Val Ser Ala Thr Lys Gln				
	465		470	475
Ile Lys Thr His Gly Glu Pro Thr Thr Leu Tyr Phe Asn Gly Asn Ile				
	485		490	495
Arg Pro Lys Gly Tyr Asp Ile Phe Thr Val Gly Ile Gly Val Asn Gly				
	500		505	510
Asp Pro Gly Ala Thr Pro Leu Glu Ala Glu Lys Phe Met Gln Ser Ile				
	515		520	525
Ser Ser Lys Thr Glu Asn Tyr Thr Asn Val Asp Asp Thr Asn Lys Ile				
	530		535	540
Tyr Asp Glu Leu Asn Lys Tyr Phe Lys Thr Ile Val Glu Glu Lys His				
	545		550	555
Ser Ile Val Asp Gly Asn Val Thr Asp Pro Met Gly Glu Met Ile Glu				
	565		570	575
Phe Gln Leu Lys Asn Gly Gln Ser Phe Thr His Asp Asp Tyr Val Leu				
	580		585	590
Val Gly Asn Asp Gly Ser Gln Leu Lys Asn Gly Val Ala Leu Gly Gly				
	595		600	605
Pro Asn Ser Asp Gly Gly Ile Leu Lys Asp Val Thr Val Thr Tyr Asp				
	610		615	620
Lys Thr Ser Gln Thr Ile Lys Ile Asn His Leu Asn Leu Gly Ser Gly				
	625		630	635
Gln Lys Val Val Leu Thr Tyr Asp Val Arg Leu Lys Asp Asn Tyr Ile				
	645		650	655
Ser Asn Lys Phe Tyr Asn Thr Asn Asn Arg Thr Thr Leu Ser Pro Lys				
	660		665	670
Ser Glu Lys Glu Pro Asn Thr Ile Arg Asp Phe Pro Ile Pro Lys Ile				
	675		680	685
Arg Asp Val Arg Glu Phe Pro Val Leu Thr Ile Ser Asn Gln Lys Lys				
	690		695	700
Met Gly Glu Val Glu Phe Ile Lys Val Asn Lys Asp Lys His Ser Glu				
	705		710	715
Ser Leu Leu Gly Ala Lys Phe Gln Leu Gln Ile Glu Lys Asp Phe Ser				
	725		730	735
Gly Tyr Lys Gln Phe Val Pro Glu Gly Ser Asp Val Thr Thr Lys Asn				
	740		745	750
Asp Gly Lys Ile Tyr Phe Lys Ala Leu Gln Asp Gly Asn Tyr Lys Leu				
	755		760	765
Tyr Glu Ile Ser Ser Pro Asp Gly Tyr Ile Glu Val Lys Thr Lys Pro				
	770		775	780
Val Val Thr Phe Thr Ile Gln Asn Gly Glu Val Thr Asn Leu Lys Ala				
	785		790	800
Asp Pro Asn Ala Asn Lys Asn Gln Ile Gly Tyr Leu Glu Gly Asn Gly				

805
Lys His Leu Ile Thr Asn Thr
820

810

815

<210> 23
<211> 549
<212> DNA
<213> Streptococcus agalactiae

<400> 23
atgaaaaaac aaaaactatt actgcttatt ggaggcttat taataatgat aatgatgaca 60
gcatgtaagg attcaaaaaa cccagaaaac cgcacaaaag aagagtacca agctgaacaa 120
aattttaaac cgttttttga gtttttagca caaaaagata aagatttgag caaaatacaa 180
aaatacttac tattagtatc ggattcaggt gatgcattag atttagaata tttctatagt 240
attcaagatt taaaaaaaaa taaggattta gggaagtttg aaacaagaaa aagtcaaaata 300
gaaaagccgg gtggctataa tgagtttagaa aataaagagg tcccatttga atatttttaa 360
aataatatag tttatccaaa aggaaaaccg aatattacat ttgatgactt tattatcgga 420
gcaatggata ctaagaattt aaaagaatta aaaaaattaa aagtaaaaag ttattttatta 480
aaacatccgg aaactgagtt gaaagatata acatatgaat tgccgacaca gtcgaagcct 540
attaaaaaa 549

<210> 24
<211> 183
<212> PRT
<213> Streptococcus agalactiae

<400> 24
Met Lys Lys Gln Lys Leu Leu Leu Ile Gly Gly Leu Leu Ile Met
1 5 10 15
Ile Met Met Thr Ala Cys Lys Asp Ser Lys Ile Pro Glu Asn Arg Thr
20 25 30
Lys Glu Glu Tyr Gln Ala Glu Gln Asn Phe Lys Pro Phe Phe Glu Phe
35 40 45
Leu Ala Gln Lys Asp Lys Asp Leu Ser Lys Ile Gln Lys Tyr Leu Leu
50 55 60
Leu Val Ser Asp Ser Gly Asp Ala Leu Asp Leu Glu Tyr Phe Tyr Ser
65 70 75 80
Ile Gln Asp Leu Lys Lys Asn Lys Asp Leu Gly Lys Phe Glu Thr Arg
85 90 95
Lys Ser Gln Ile Glu Lys Pro Gly Gly Tyr Asn Glu Leu Glu Asn Lys
100 105 110
Glu Val Pro Phe Glu Tyr Phe Lys Asn Asn Ile Val Tyr Pro Lys Gly
115 120 125
Lys Pro Asn Ile Thr Phe Asp Asp Phe Ile Ile Gly Ala Met Asp Thr
130 135 140
Lys Glu Leu Lys Glu Leu Lys Lys Leu Lys Val Lys Ser Tyr Leu Leu
145 150 155 160
Lys His Pro Glu Thr Glu Leu Lys Asp Ile Thr Tyr Glu Leu Pro Thr
165 170 175
Gln Ser Lys Leu Ile Lys Lys
180

<210> 25
<211> 161
<212> PRT

<213> Streptococcus agalactiae

<400> 25

Lys Asp Ser Lys Ile Pro Glu Asn Arg Thr Lys Glu Glu Tyr Gln Ala
 1 5 10 15
 Glu Gln Asn Phe Lys Pro Phe Phe Glu Phe Leu Ala Gln Lys Asp Lys
 20 25 30
 Asp Leu Ser Lys Ile Gln Lys Tyr Leu Leu Leu Val Ser Asp Ser Gly
 35 40 45
 Asp Ala Leu Asp Leu Glu Tyr Phe Tyr Ser Ile Gln Asp Leu Lys Lys
 50 55 60
 Asn Lys Asp Leu Gly Lys Phe Glu Thr Arg Lys Ser Gln Ile Glu Lys
 65 70 75 80
 Pro Gly Gly Tyr Asn Glu Leu Glu Asn Lys Glu Val Pro Phe Glu Tyr
 85 90 95
 Phe Lys Asn Asn Ile Val Tyr Pro Lys Gly Lys Pro Asn Ile Thr Phe
 100 105 110
 Asp Asp Phe Ile Ile Gly Ala Met Asp Thr Lys Glu Leu Lys Glu Leu
 115 120 125
 Lys Lys Leu Lys Val Lys Ser Tyr Leu Leu Lys His Pro Glu Thr Glu
 130 135 140
 Leu Lys Asp Ile Thr Tyr Glu Leu Pro Thr Gln Ser Lys Leu Ile Lys
 145 150 155 160
 Lys

<210> 26

<211> 3402

<212> DNA

<213> Streptococcus agalactiae

<400> 26

ttgcgtataaa	aacaaaaact	accattttgat	aaacttgcca	ttgcgccttat	atctacgagc	60
atcttgctcta	atgcacaatc	agacattaaa	gcaaatactg	tgacagaaga	cactcctgct	120
accgaacaag	ccgtagaacc	cccacaacca	atagcagttt	ctgaggaatc	acgatcatca	180
aaggaaacta	aaacctcaca	aactcctagt	gatgtaggag	aaacagtagc	agatgacgct	240
aatgatctag	ccctcaagc	tcctgctaaa	actgctgata	caccagcaac	ctcaaaaagcg	300
actattatggg	atttgaacga	ccctctctcat	gtcaaaaacc	tcgacggaaga	agcaggaacg	360
ggagctgggga	ccgtgtgtgc	agtgattgat	gctggttttg	ataaaaatca	tgaagcgtgg	420
cgcttaacag	acaaaactaa	agcacgttac	caatcaaaag	aaaactcttga	aaaagctaaa	480
aaagagcacg	gtattaccta	tggcgagtgg	gtcaatgata	aggttgctta	ttaccacgac	540
tatatgaaag	atggtaaaaa	cgctgttgat	caagaacacg	gcacacacgt	gtcaggggatc	600
ttgtcaggaa	atgctccatc	tgaatatgaa	gaaccttacc	gcctagaagg	tgcgatgcct	660
gaggctcaat	tgcttttgat	gcgtgtcgaa	attgtaaatg	gactagcaga	ctatgctcgt	720
aactacgctc	aagctatcag	agatgctgtc	aacttgggag	ctaaggtgat	taatatgagc	780
tttggtaatg	ctgcactagc	ttacgccaac	cttcacagac	aaacaaaaaa	agcctttgac	840
tatgccaatt	caaaagggtg	tagcattgtg	acctcagctg	gtaatgatag	tagctttggg	900
ggcaagcccc	gtctacctct	agcagatcat	cctgattatg	gggtgggttg	gacacctgca	960
gcggcgagatt	caacattgac	agttgcttct	tacagccagc	ataaacagct	cactgaaact	1020
gctacggtca	aaacagacga	tcatcaagat	aaagaaatgc	ctgttatttc	aacaaaccgt	1080
tttagagccaa	acaaggctta	cgactatgct	tatgctaate	gtggtagcaa	agaggatgat	1140
tttaaggatg	tcgaaggtaa	gattgccctt	attgaacgtg	gcgatattga	tttcaaatga	1200
aagattgcgaa	acgctaaaaa	agctgggtct	gtagggggtc	tgatctatga	caatcaagac	1260
aagggcttcc	cgattgaatt	gccaaatgtt	gaccagatgc	ctgcggcctt	tatcagtcga	1320
agagacggtc	tcttattaaa	agacaatccc	ccaaaaacca	ttaccttcaa	tcgcagacct	1380

```

aaggtattgc caacagcaag tggcaccaaa ctaagccgct tctcaagctg gggctcgaca 1440
gctgacggca atattaaacc ggatattgca gcaccggcc aagatatttt gtcacagtg 1500
gctaacacaa agtatgcaaa actttcttga actagtagtg ctgcaccatt gctagcggtg 1560
atcatcgaaa ttttgcacaa gcaatatgag acacagtagt ctgatatgac accatcagag 1620
cgctcttgat tagctaagaa agtatgtgat agctcagcaa ctgccctata tgatgaagat 1680
gaaaaagctt attttcttcc tcgccaacag ggagcaggag cagtcgatgc taaaaaagct 1740
tcagcagcaa cgatgtatgt aacagataag gacataacct caagcaaggt tcacctgaac 1800
aatgtttctg ataaatttga agtaacagta acagttcaca acaaatctga taaacctcaa 1860
gagttgtgatt accaagtaac tgttcaaaac gataaagtag attggaataca cttagctttg 1920
gctcctaaga catgtgtatga gacatcatgg caaaaaatca caattccagc caatgacgag 1980
aaacaagtca ccgttccaat cgaatgctagt cgaatttagca aggacttgct tgcccacaatg 2040
aaaaatggct atttcttaga aggttttgtt cgtttcaaac aagatcctac aaaagaagag 2100
cttatgagca ttccatatat tggtttccga ggtgattttg gcaatctgtc agccttagaa 2160
aaaccaatct atgatagcaa agacggtagc agctactatc atgaagcaaa tagtgatgcc 2220
aaagaccaat tagtggtgta tggattacag ttttacgctc tgaaaaataa ctttacagca 2280
cttaccacag agtctaacc cttgacgatt attaaagctg tcaaaagaag gtgtgaaaac 2340
atagaggata tcgaatcttc agagatcaca gaaaccattt ttgcaggtag ttttgcaaaa 2400
caagacgatg atagccacta ctatatccac cgtcacgcta atggcacaac atatgtctgcg 2460
atctctccaa atggggacgg taacagagat tatgtccaat tccaaggtag tttcttgcgt 2520
aatgtcaaaa accttctggc tgaagtcttg gacaaagaag gaaatgtttg ttggacaagt 2580
gaggtaaccg agcaagttgt taaaaactac aacaatgact ttgcaagcac acttggttca 2640

```

```

accgcttttg aaaaaacgcg ttgggacggt aaagataaag acggcacaagt tgtgtctaac 2700
ggaaacctaca cctatcgtgt tcgctacacg ccgattagct cagggtgcaaa agaacaacac 2760
actgattttg atgtgattgt agacaatacg acacctgaag tcgcacaatc ggcaacattc 2820
tcaacagaag atagctgttt gacacttgca tctaaccacaa aacacagcca accggtttac 2880
cgtgagcgta ttgcttacac ttatatggat gaggatctgc caacaacaga gtatatctct 2940
ccaaatgaag atggtacctt tactcttctc gaagaggctg aaacaatgga aggcgctact 3000
gttccattga aaatgtcaga ctttacttat gttgttgaag atatggcttg taacataact 3060
tatacacagg tgactaagct attggagggc cactctaata agccagaaca agacggttca 3120
gatcaagcac cagacaagaa accagaagct aaaccagaa aagacggttc aggtcaaaaca 3180
ccagataaaa aaaaagaaac taaaccagaa aaagatagtt cagggtcaaac accaggtaaa 3240
actcctcaaa aaggtcaact ttctcgtact ctagagaaac gatcttctaa cgctgcttta 3300
gtacacaaa catcaacaag agatcagtta ccaacgacta atgacaagga tacaatactg 3360
ttacatctcc ttaagttagt tatgaccact ttctctcttg ga 3402

```

```

<210> 27
<211> 1134
<212> PRT
<213> Streptococcus agalactiae

```

```

<400> 27
Met Arg Lys Lys Gln Lys Leu Pro Phe Asp Lys Leu Ala Ile Ala Leu
1 5 10 15
Ile Ser Thr Ser Ile Leu Leu Asn Ala Gln Ser Asp Ile Lys Ala Asn
20 25 30
Thr Val Thr Glu Asp Thr Pro Ala Thr Glu Gln Ala Val Glu Pro Pro
35 40 45
Gln Pro Ile Ala Val Ser Glu Glu Ser Arg Ser Ser Lys Glu Thr Lys
50 55 60
Thr Ser Gln Thr Pro Ser Asp Val Gly Glu Thr Val Ala Asp Asp Ala
65 70 75 80
Asn Asp Leu Ala Pro Gln Ala Pro Ala Lys Thr Ala Asp Thr Pro Ala
85 90 95
Thr Ser Lys Thr Thr Ile Arg Asp Leu Asn Asp Pro Ser His Val Lys

```

				100						105					110				
Thr	Leu	Gln	Glu	Lys	Ala	Gly	Lys	Gly	Ala	Gly	Thr	Val	Val	Ala	Val				
		115					120					125							
Ile	Asp	Ala	Gly	Phe	Asp	Lys	Asn	His	Glu	Ala	Trp	Arg	Leu	Thr	Asp				
	130					135					140								
Lys	Thr	Lys	Ala	Arg	Tyr	Gln	Ser	Lys	Glu	Asn	Leu	Glu	Lys	Ala	Lys				
145					150					155					160				
Lys	Glu	His	Gly	Ile	Thr	Tyr	Gly	Glu	Trp	Val	Asn	Asp	Lys	Val	Ala				
				165					170					175					
Tyr	Tyr	His	Asp	Tyr	Ser	Lys	Asp	Gly	Lys	Asn	Ala	Val	Asp	Gln	Glu				
			180					185					190						
His	Gly	Thr	His	Val	Ser	Gly	Ile	Leu	Ser	Gly	Asn	Ala	Pro	Ser	Glu				
		195					200					205							
Met	Lys	Glu	Pro	Tyr	Arg	Leu	Glu	Gly	Ala	Met	Pro	Glu	Ala	Gln	Leu				
	210					215					220								
Leu	Leu	Met	Arg	Val	Glu	Ile	Val	Asn	Gly	Leu	Ala	Asp	Tyr	Ala	Arg				
225					230					235					240				
Asn	Tyr	Ala	Gln	Ala	Ile	Arg	Asp	Ala	Val	Asn	Leu	Gly	Ala	Lys	Val				
				245					250						255				
Ile	Asn	Met	Ser	Phe	Gly	Asn	Ala	Ala	Leu	Ala	Tyr	Ala	Asn	Leu	Pro				
			260					265					270						
Asp	Glu	Thr	Lys	Lys	Ala	Phe	Asp	Tyr	Ala	Lys	Ser	Lys	Gly	Val	Ser				
		275					280					285							
Ile	Val	Thr	Ser	Ala	Gly	Asn	Asp	Ser	Ser	Phe	Gly	Lys	Pro	Arg					
	290					295					300								
Leu	Pro	Leu	Ala	Asp	His	Pro	Asp	Tyr	Gly	Val	Val	Gly	Thr	Pro	Ala				
305					310				315						320				
Ala	Ala	Asp	Ser	Thr	Leu	Thr	Val	Ala	Ser	Tyr	Ser	Pro	Asp	Lys	Gln				
				325					330					335					
Leu	Thr	Glu	Thr	Ala	Thr	Val	Lys	Thr	Asp	Asp	His	Gln	Asp	Lys	Glu				
				340				345					350						
Met	Pro	Val	Ile	Ser	Thr	Asn	Arg	Phe	Glu	Pro	Asn	Lys	Ala	Tyr	Asp				
		355					360					365							
Tyr	Ala	Tyr	Ala	Asn	Arg	Gly	Thr	Lys	Glu	Asp	Asp	Phe	Lys	Asp	Val				
	370					375					380								
Glu	Gly	Lys	Ile	Ala	Leu	Ile	Glu	Arg	Gly	Asp	Asp	Ala	Phe	Lys	Asp				
385					390					395					400				
Lys	Ile	Ala	Asn	Ala	Lys	Lys	Ala	Gly	Ala	Val									

Ala Lys Lys Val Leu Met Ser Ser Ala Thr Ala Leu Tyr Asp Glu Asp
 545 550 555 560
 Glu Lys Ala Tyr Phe Ser Pro Arg Gln Gln Gly Ala Gly Ala Val Asp
 565 570 575
 Ala Lys Lys Ala Ser Ala Ala Thr Met Tyr Val Thr Asp Lys Asp Asn
 580 585 590
 Thr Ser Ser Lys Val His Leu Asn Asn Val Ser Asp Lys Phe Glu Val
 595 600 605
 Thr Val Thr Val His Asn Lys Ser Asp Lys Pro Gln Glu Leu Tyr Tyr
 610 615 620
 Gln Val Thr Val Gln Thr Asp Lys Val Asp Gly Lys His Phe Ala Leu
 625 630 635 640
 Ala Pro Lys Ala Leu Tyr Glu Thr Ser Trp Gln Lys Ile Thr Ile Pro
 645 650 655
 Ala Asn Ser Ser Lys Gln Val Thr Val Pro Ile Asp Ala Ser Arg Phe
 660 665 670
 Ser Lys Asp Leu Leu Ala Gln Met Lys Asn Gly Tyr Phe Leu Glu Gly
 675 680 685
 Phe Val Arg Phe Lys Gln Asp Pro Thr Lys Glu Glu Leu Met Ser Ile
 690 695 700
 Pro Tyr Ile Gly Phe Arg Gly Asp Phe Gly Asn Leu Ser Ala Leu Glu
 705 710 715 720
 Lys Pro Ile Tyr Asp Ser Lys Asp Gly Ser Tyr Tyr His Glu Ala
 725 730 735
 Asn Ser Asp Ala Lys Asp Gln Leu Asp Gly Asp Gly Leu Gln Phe Tyr
 740 745 750
 Ala Leu Lys Asn Asn Phe Thr Ala Leu Thr Thr Glu Ser Asn Pro Trp
 755 760 765
 Thr Ile Ile Lys Ala Val Lys Glu Gly Val Glu Asn Ile Glu Asp Ile
 770 775 780
 Glu Ser Ser Glu Ile Thr Glu Thr Ile Phe Ala Gly Thr Phe Ala Lys
 785 790 795 800
 Gln Asp Asp Asp Ser His Tyr Tyr Ile His Arg His Ala Asn Gly Lys
 805 810 815
 Pro Tyr Ala Ala Ile Ser Pro Asn Gly Asp Gly Asn Arg Asp Tyr Val
 820 825 830
 Gln Phe Gln Gly Thr Phe Leu Arg Asn Ala Lys Asn Leu Val Ala Glu
 835 840 845
 Val Leu Asp Lys Glu Gly Asn Val Val Trp Thr Ser Glu Val Thr Glu
 850 855 860
 Gln Val Val Lys Asn Tyr Asn Asn Asp Leu Ala Ser Thr Leu Gly Ser
 865 870 875 880
 Thr Arg Phe Glu Lys Thr Arg Trp Asp Gly Lys Asp Lys Asp Gly Lys
 885 890 895
 Val Val Ala Asn Gly Thr Tyr Thr Tyr Arg Val Arg Tyr Thr Pro Ile
 900 905 910
 Ser Ser Gly Ala Lys Glu Gln His Thr Asp Phe Asp Val Ile Val Asp
 915 920 925
 Asn Thr Thr Pro Glu Val Ala Thr Ser Ala Thr Phe Ser Thr Glu Asp
 930 935 940
 Ser Arg Leu Thr Leu Ala Ser Lys Pro Lys Thr Ser Gln Pro Val Tyr
 945 950 955 960
 Arg Glu Arg Ile Ala Tyr Thr Tyr Met Asp Glu Asp Leu Pro Thr Thr
 965 970 975
 Glu Tyr Ile Ser Pro Asn Glu Asp Gly Thr Phe Thr Leu Pro Glu Glu

980 985 990
 Ala Glu Thr Met Glu Gly Ala Thr Val Pro Leu Lys Met Ser Asp Phe
 995 1000 1005
 Thr Tyr Val Val Glu Asp Met Ala Gly Asn Ile Thr Tyr Thr Pro Val
 1010 1015 1020
 Thr Lys Leu Leu Glu Gly His Ser Asn Lys Pro Glu Gln Asp Gly Ser
 1025 1030 1035 1040
 Asp Gln Ala Pro Asp Lys Lys Pro Glu Ala Lys Pro Glu Gln Asp Gly
 1045 1050 1055
 Ser Gly Gln Thr Pro Asp Lys Lys Lys Glu Thr Lys Pro Glu Lys Asp
 1060 1065 1070
 Ser Ser Gly Gln Thr Pro Gly Lys Thr Pro Gln Lys Gly Gln Ser Ser
 1075 1080 1085
 Arg Thr Leu Glu Lys Arg Ser Ser Lys Arg Ala Leu Ala Thr Lys Ala
 1090 1095 1100
 Ser Thr Arg Asp Gln Leu Pro Thr Thr Asn Asp Lys Asp Thr Asn Arg
 1105 1110 1115 1120
 Leu His Leu Leu Lys Leu Val Met Thr Thr Phe Phe Leu Gly
 1125 1130

<210> 28
 <211> 1109
 <212> FRT
 <213> Streptococcus agalactiae

<400> 28
 Gln Ser Asp Ile Lys Ala Asn Thr Val Thr Glu Asp Thr Pro Ala Thr
 1 5 10 15
 Glu Gln Ala Val Glu Pro Pro Gln Pro Ile Ala Val Ser Glu Glu Ser
 20 25 30
 Arg Ser Ser Lys Glu Thr Lys Thr Ser Gln Thr Pro Ser Asp Val Gly
 35 40 45
 Glu Thr Val Ala Asp Asp Ala Asn Asp Leu Ala Pro Gln Ala Pro Ala
 50 55 60
 Lys Thr Ala Asp Thr Pro Ala Thr Ser Lys Ala Thr Ile Arg Asp Leu
 65 70 75 80
 Asn Asp Pro Ser His Val Lys Thr Leu Gln Glu Lys Ala Gly Lys Gly
 85 90 95
 Ala Gly Thr Val Val Ala Val Ile Asp Ala Gly Phe Asp Lys Asn His
 100 105 110
 Glu Ala Trp Arg Leu Thr Asp Lys Thr Lys Ala Arg Tyr Gln Ser Lys
 115 120 125
 Glu Asn Leu Glu Lys Ala Lys Lys Glu His Gly Ile Thr Tyr Gly Glu
 130 135 140
 Trp Val Asn Asp Lys Val Ala Tyr Tyr His Asp Tyr Ser Lys Asp Gly
 145 150 155 160
 Lys Asn Ala Val Asp Gln Glu His Gly Thr His Val Ser Gly Ile Leu
 165 170 175
 Ser Gly Asn Ala Pro Ser Glu Met Lys Glu Pro Tyr Arg Leu Glu Gly
 180 185 190
 Ala Met Pro Glu Ala Gln Leu Leu Leu Met Arg Val Glu Ile Val Asn
 195 200 205
 Gly Leu Ala Asp Tyr Ala Arg Asn Tyr Ala Gln Ala Ile Arg Asp Ala
 210 215 220
 Val Asn Leu Gly Ala Lys Val Ile Asn Met Ser Phe Gly Asn Ala Ala

225					230					235				240
Leu	Ala	Tyr	Ala	Asn	Leu	Pro	Asp	Glu	Thr	Lys	Lys	Ala	Phe	Asp
				245					250					255
Ala	Lys	Ser	Lys	Gly	Val	Ser	Ile	Val	Thr	Ser	Ala	Gly	Asn	Asp
			260					265					270	
Ser	Phe	Gly	Gly	Lys	Pro	Arg	Leu	Pro	Leu	Ala	Asp	His	Pro	Asp
		275					280					285		Tyr
Gly	Val	Val	Gly	Thr	Pro	Ala	Ala	Ala	Asp	Ser	Thr	Leu	Thr	Val
	290					295					300			Ala
Ser	Tyr	Ser	Pro	Asp	Lys	Gln	Leu	Thr	Glu	Thr	Ala	Thr	Val	Lys
	305				310					315				320
Asp	Asp	His	Gln	Asp	Lys	Glu	Met	Pro	Val	Ile	Ser	Thr	Asn	Arg
				325					330				335	Phe
Glu	Pro	Asn	Lys	Ala	Tyr	Asp	Tyr	Ala	Tyr	Ala	Asn	Arg	Gly	Thr
		340						345				350		Lys
Glu	Asp	Asp	Phe	Lys	Asp	Val	Glu	Gly	Lys	Ile	Ala	Leu	Ile	Glu
		355				360						365		Arg
Gly	Asp	Ile	Asp	Phe	Lys	Asp	Lys	Ile	Ala	Asn	Ala	Lys	Lys	Ala
	370					375				380				Gly
Ala	Val	Gly	Val	Leu	Ile	Tyr	Asp	Asn	Gln	Asp	Lys	Gly	Phe	Pro
	385				390					395				Ile
Glu	Leu	Pro	Asn	Val	Asp	Gln	Met	Pro	Ala	Ala	Phe	Ile	Ser	Arg
			405						410					Arg
Asp	Gly	Leu	Leu	Leu	Lys	Asp	Asn	Pro	Pro	Lys	Thr	Ile	Thr	Phe
		420						425					430	Asn
Ala	Thr	Pro	Lys	Val	Leu	Pro	Thr	Ala	Ser	Gly	Thr	Lys	Leu	Ser
		435					440					445		Arg
Phe	Ser	Ser	Trp	Gly	Leu	Thr	Ala	Asp	Gly	Asn	Ile	Lys	Pro	Asp
	450					455				460				Ile
Ala	Ala	Pro	Gly	Gln	Asp	Ile	Leu	Ser	Ser	Val	Ala	Asn	Asn	Lys
	465				470					475				Tyr
Ala	Lys	Leu	Ser	Gly	Thr	Ser	Met	Ser	Ala	Pro	Leu	Val	Ala	Gly
			485					490					495	Ile
Met	Gly	Leu	Leu	Gln	Lys	Gln	Tyr	Glu	Thr	Gln	Tyr	Pro	Asp	Met
		500						505				510		Thr
Pro	Ser	Glu	Arg	Leu	Asp	Leu	Ala	Lys	Lys	Val	Leu	Met	Ser	Ser
		515					520					525		Ala
Thr	Ala	Leu	Tyr	Asp	Glu	Asp	Glu	Lys	Ala	Tyr	Phe	Ser	Pro	Arg
	530					535				540				Gln
Gln	Gly	Ala	Gly	Ala	Val	Asp	Ala	Lys	Lys	Ala	Ser	Ala	Ala	Thr
	545				550					555				Met
Tyr	Val	Thr	Asp	Lys	Asp	Asn	Thr	Ser	Ser	Lys	Val	His	Leu	Asn
			565					570					575	Asn
Val	Ser	Asp	Lys	Phe	Glu	Val	Thr	Val	Thr	Val	His	Asn	Lys	Ser
		580					585					590		Asp
Lys	Pro	Gln	Glu	Leu	Tyr	Tyr	Gln	Val	Thr	Val	Gln	Thr	Asp	Lys
		595					600					605		Val
Asp	Gly	Lys	His	Phe	Ala	Leu	Ala	Pro	Lys	Ala	Leu	Tyr	Glu	Thr
	610					615				620				Ser
Trp	Gln	Lys	Ile	Thr	Ile	Pro	Ala	Asn	Ser	Ser	Lys	Gln	Val	Thr
	625				630					635				Val
Pro	Ile	Asp	Ala	Ser	Arg	Phe	Ser	Lys	Asp	Leu	Leu	Ala	Gln	Met
			645					650					655	Lys
Asn	Gly	Tyr	Phe	Leu	Glu	Gly	Phe	Val	Arg	Phe	Lys	Gln	Asp	Pro
		660					665					670		Thr

Lys Glu Glu Leu Met Ser Ile Pro Tyr Ile Gly Phe Arg Gly Asp Phe
 675 680 685
 Gly Asn Leu Ser Ala Leu Glu Lys Pro Ile Tyr Asp Ser Lys Asp Gly
 690 695 700
 Ser Ser Tyr Tyr His Glu Ala Asn Ser Asp Ala Lys Asp Gln Leu Asp
 705 710 715 720
 Gly Asp Gly Leu Gln Phe Tyr Ala Leu Lys Asn Asn Phe Thr Ala Leu
 725 730 735
 Thr Thr Glu Ser Asn Pro Trp Thr Ile Ile Lys Ala Val Lys Glu Gly
 740 745 750
 Val Glu Asn Ile Glu Asp Ile Glu Ser Ser Glu Ile Thr Glu Thr Ile
 755 760 765
 Phe Ala Gly Thr Phe Ala Lys Glu Asp Asp Asp Ser His Tyr Tyr Ile
 770 775 780
 His Arg His Ala Asn Gly Lys Pro Tyr Ala Ala Ile Ser Pro Asn Gly
 785 790 795 800
 Asp Gly Asn Arg Asp Tyr Val Gln Phe Gln Gly Thr Phe Leu Arg Asn
 805 810 815
 Ala Lys Asn Leu Val Ala Glu Val Leu Asp Lys Glu Gly Asn Val Val
 820 825 830
 Trp Thr Ser Glu Val Thr Glu Gln Val Val Lys Asn Tyr Asn Asn Asp
 835 840 845
 Leu Ala Ser Thr Leu Gly Ser Thr Arg Phe Glu Lys Thr Arg Trp Asp
 850 855 860
 Gly Lys Asp Lys Asp Gly Lys Val Val Ala Asn Gly Thr Tyr Thr Tyr
 865 870 875 880
 Arg Val Arg Tyr Thr Pro Ile Ser Ser Gly Ala Lys Glu Gln His Thr
 885 890 895
 Asp Phe Asp Val Ile Val Asp Asn Thr Thr Pro Glu Val Ala Thr Ser
 900 905 910
 Ala Thr Phe Ser Thr Glu Asp Ser Arg Leu Thr Leu Ala Ser Lys Pro
 915 920 925
 Lys Thr Ser Gln Pro Val Tyr Arg Glu Arg Ile Ala Tyr Thr Tyr Met
 930 935 940
 Asp Glu Asp Leu Pro Thr Thr Glu Tyr Ile Ser Pro Asn Glu Asp Gly
 945 950 955 960
 Thr Phe Thr Leu Pro Glu Glu Ala Glu Thr Met Glu Gly Ala Thr Val
 965 970 975
 Pro Leu Lys Met Ser Asp Phe Thr Tyr Val Val Glu Asp Met Ala Gly
 980 985 990
 Asn Ile Thr Tyr Thr Pro Val Thr Lys Leu Leu Glu Gly His Ser Asn
 995 1000 1005
 Lys Pro Glu Gln Asp Gly Ser Asp Gln Ala Pro Asp Lys Lys Pro Glu
 1010 1015 1020
 Ala Lys Pro Glu Gln Asp Gly Ser Gly Gln Thr Pro Asp Lys Lys Lys
 1025 1030 1035 1040
 Glu Thr Lys Pro Glu Lys Asp Ser Ser Gly Gln Thr Pro Gly Lys Thr
 1045 1050 1055
 Pro Gln Lys Gly Gln Ser Ser Arg Thr Leu Glu Lys Arg Ser Ser Lys
 1060 1065 1070
 Arg Ala Leu Ala Thr Lys Ala Ser Thr Arg Asp Gln Leu Pro Thr Thr
 1075 1080 1085
 Asn Asp Lys Asp Thr Asn Arg Leu His Leu Leu Lys Leu Val Met Thr
 1090 1095 1100
 Thr Phe Phe Leu Gly

1105

<210> 29
 <211> 1103
 <212> PRT
 <213> Streptococcus agalactiae

<400> 29
 Met Arg Lys Lys Gln Lys Leu Pro Phe Asp Lys Leu Ala Ile Ala Leu
 1 5 10 15
 Ile Ser Thr Ser Ile Leu Leu Asn Ala Gln Ser Asp Ile Lys Ala Asn
 20 25 30
 Thr Val Thr Glu Asp Thr Pro Ala Thr Glu Gln Ala Val Glu Pro Pro
 35 40 45
 Gln Pro Ile Ala Val Ser Glu Glu Ser Arg Ser Ser Lys Glu Thr Lys
 50 55 60
 Thr Ser Gln Thr Pro Ser Asp Val Gly Glu Thr Val Ala Asp Asp Ala
 65 70 75 80
 Asn Asp Leu Ala Pro Gln Ala Pro Ala Lys Thr Ala Asp Thr Pro Ala
 85 90 95
 Thr Ser Lys Ala Thr Ile Arg Asp Leu Asn Asp Pro Ser His Val Lys
 100 105 110
 Thr Leu Gln Glu Lys Ala Gly Lys Gly Ala Gly Thr Val Val Ala Val
 115 120 125
 Ile Asp Ala Gly Phe Asp Lys Asn His Glu Ala Trp Arg Leu Thr Asp
 130 135 140
 Lys Thr Lys Ala Arg Tyr Gln Ser Lys Glu Asn Leu Glu Lys Ala Lys
 145 150 155 160
 Lys Glu His Gly Ile Thr Tyr Gly Glu Trp Val Asn Asp Lys Val Ala
 165 170 175
 Tyr Tyr His Asp Tyr Ser Lys Asp Gly Lys Asn Ala Val Asp Gln Glu
 180 185 190
 His Gly Thr His Val Ser Gly Ile Leu Ser Gly Asn Ala Pro Ser Glu
 195 200 205
 Met Lys Glu Pro Tyr Arg Leu Glu Gly Ala Met Pro Glu Ala Gln Leu
 210 215 220
 Leu Leu Met Arg Val Glu Ile Val Asn Gly Leu Ala Asp Tyr Ala Arg
 225 230 235 240
 Asn Tyr Ala Gln Ala Ile Arg Asp Ala Val Asn Leu Gly Ala Lys Val
 245 250 255
 Ile Asn Met Ser Phe Gly Asn Ala Ala Leu Ala Tyr Ala Asn Leu Pro
 260 265 270
 Asp Glu Thr Lys Lys Ala Phe Asp Tyr Ala Lys Ser Lys Gly Val Ser
 275 280 285
 Ile Val Thr Ser Ala Gly Asn Asp Ser Ser Phe Gly Gly Lys Pro Arg
 290 295 300
 Leu Pro Leu Ala Asp His Pro Asp Tyr Gly Val Val Gly Thr Pro Ala
 305 310 315 320
 Ala Ala Asp Ser Thr Leu Thr Val Ala Ser Tyr Ser Pro Asp Lys Gln
 325 330 335
 Leu Thr Glu Thr Ala Thr Val Lys Thr Asp Asp His Gln Asp Lys Glu
 340 345 350
 Met Pro Val Ile Ser Thr Asn Arg Phe Glu Pro Asn Lys Ala Tyr Asp
 355 360 365
 Tyr Ala Tyr Ala Asn Arg Gly Thr Lys Glu Asp Asp Phe Lys Asp Val

370		375		380
Glu Gly Lys Ile Ala Leu	Ile Glu Arg Gly Asp	Ile Asp Phe Lys Asp		
385		390		400
Lys Ile Ala Asn Ala Lys	Lys Ala Gly Ala Val	Gly Val Leu Ile Tyr		
	405	410		415
Asp Asn Gln Asp Lys	Gly Phe Pro Ile	Glu Leu Pro Asn Val	Asp Gln	
	420	425	430	
Met Pro Ala Ala Phe	Ile Ser Arg Arg Asp	Gly Leu Leu Leu Lys	Asp	
	435	440	445	
Asn Pro Pro Lys Thr	Ile Thr Phe Asn Ala	Thr Pro Lys Val Leu	Pro	
	450	455	460	
Thr Ala Ser Gly Thr	Lys Leu Ser Arg Phe	Ser Ser Trp Gly Leu	Thr	
	470	475	480	
Ala Asp Gly Asn Ile	Lys Pro Asp Ile Ala	Ala Pro Gly Gln Asp	Ile	
	485	490	495	
Leu Ser Ser Val Ala	Asn Asn Lys Tyr	Ala Lys Leu Ser Gly	Thr Ser	
	500	505	510	
Met Ser Ala Pro Leu	Val Ala Gly Ile	Met Gly Leu Leu Gln	Lys Gln	
	515	520	525	
Tyr Glu Thr Gln Tyr	Pro Asp Met Thr	Pro Ser Glu Arg	Leu Asp Leu	
	530	535	540	
Ala Lys Lys Val Leu	Met Ser Ser Ala Thr	Ala Leu Tyr Asp	Glu Asp	
	545	550	555	560
Glu Lys Ala Tyr Phe	Ser Pro Arg Gln	Gln Gly Ala Gly	Ala Val Asp	
	565	570	575	
Ala Lys Lys Ala Ser	Ala Ala Thr Met	Tyr Val Thr Asp	Lys Asp Asn	
	580	585	590	
Thr Ser Ser Lys Val	His Leu Asn Asn	Val Ser Asp Lys	Phe Glu Val	
	595	600	605	
Thr Val Thr Val His	Asn Lys Ser Asp	Lys Pro Gln Glu	Leu Tyr Tyr	
	610	615	620	
Gln Val Thr Val Gln	Thr Asp Lys Val	Asp Gly Lys His	Phe Ala Leu	
	625	630	635	640
Ala Pro Lys Ala Leu	Tyr Glu Thr Ser	Trp Gln Lys Ile	Thr Ile Pro	
	645	650	655	
Ala Asn Ser Ser Lys	Gln Val Thr Val	Pro Ile Asp Ala	Ser Arg Phe	
	660	665	670	
Ser Lys Asp Leu Leu	Ala Gln Met Lys	Asn Gly Tyr Phe	Leu Glu Gly	
	675	680	685	
Phe Val Arg Phe Lys	Gln Asp Pro Thr	Lys Glu Glu Leu	Met Ser Ile	
	690	695	700	
Pro Tyr Ile Gly Phe	Arg Gly Asp Phe	Gly Asn Leu Ser	Ala Leu Glu	
	705	710	715	720
Lys Pro Ile Tyr Asp	Ser Lys Asp Gly	Ser Ser Tyr Tyr	His Glu Ala	
	725	730	735	
Asn Ser Asp Ala Lys	Asp Gln Leu Asp	Gly Asp Gly Leu	Gln Phe Tyr	
	740	745	750	
Ala Leu Lys Asn Asn	Phe Thr Ala Leu	Thr Thr Glu Ser	Asn Pro Trp	
	755	760	765	
Thr Ile Ile Lys Ala	Val Lys Glu Gly	Val Glu Asn Ile	Glu Asp Ile	
	770	775	780	
Glu Ser Ser Glu Ile	Thr Glu Thr Ile	Phe Ala Gly Thr	Phe Ala Lys	
	785	790	795	800
Gln Asp Asp Asp Ser	His Tyr Tyr Ile	His Arg His Ala	Asn Gly Lys	

805 810 815
 Pro Tyr Ala Ala Ile Ser Pro Asn Gly Asp Gly Asn Arg Asp Tyr Val
 820 825 830
 Gln Phe Gln Gly Thr Phe Leu Arg Asn Ala Lys Asn Leu Val Ala Glu
 835 840 845
 Val Leu Asp Lys Glu Gly Asn Val Val Trp Thr Ser Glu Val Thr Glu
 850 855 860
 Gln Val Val Lys Asn Tyr Asn Asn Asp Leu Ala Ser Thr Leu Gly Ser
 865 870 875 880
 Thr Arg Phe Glu Lys Thr Arg Trp Asp Gly Lys Asp Lys Asp Gly Lys
 885 890 895
 Val Val Ala Asn Gly Thr Tyr Thr Tyr Arg Val Arg Tyr Thr Pro Ile
 900 905 910
 Ser Ser Gly Ala Lys Glu Gln His Thr Asp Phe Asp Val Ile Val Asp
 915 920 925
 Asn Thr Thr Pro Glu Val Ala Thr Ser Ala Thr Phe Ser Thr Glu Asp
 930 935 940
 Ser Arg Leu Thr Leu Ala Ser Lys Pro Lys Thr Ser Gln Pro Val Tyr
 945 950 955 960
 Arg Glu Arg Ile Ala Tyr Thr Tyr Met Asp Glu Asp Leu Pro Thr Thr
 965 970 975
 Glu Tyr Ile Ser Pro Asn Glu Asp Gly Thr Phe Thr Leu Pro Glu Glu
 980 985 990
 Ala Glu Thr Met Glu Gly Ala Thr Val Pro Leu Lys Met Ser Asp Phe
 995 1000 1005
 Thr Tyr Val Val Glu Asp Met Ala Gly Asn Ile Thr Tyr Thr Pro Val
 1010 1015 1020
 Thr Lys Leu Leu Glu Gly His Ser Asn Lys Pro Glu Gln Asp Gly Ser
 1025 1030 1035 1040
 Asp Gln Ala Pro Asp Lys Lys Pro Glu Ala Lys Pro Glu Gln Asp Gly
 1045 1050 1055
 Ser Gly Gln Thr Pro Asp Lys Lys Lys Glu Thr Lys Pro Glu Lys Asp
 1060 1065 1070
 Ser Ser Gly Gln Thr Pro Gly Lys Thr Pro Gln Lys Gly Gln Ser Ser
 1075 1080 1085
 Arg Thr Leu Glu Lys Arg Ser Ser Lys Arg Ala Leu Ala Thr Lys
 1090 1095 1100
 <210> 30
 <211> 1078
 <212> PRT
 <213> Streptococcus agalactiae
 <400> 30
 Gln Ser Asp Ile Lys Ala Asn Thr Val Thr Glu Asp Thr Pro Ala Thr
 1 5 10 15
 Glu Gln Ala Val Glu Pro Pro Gln Pro Ile Ala Val Ser Glu Glu Ser
 20 25 30
 Arg Ser Ser Lys Glu Thr Lys Thr Ser Gln Thr Pro Ser Asp Val Gly
 35 40 45
 Glu Thr Val Ala Asp Asp Ala Asn Asp Leu Ala Pro Gln Ala Pro Ala
 50 55 60
 Lys Thr Ala Asp Thr Pro Ala Thr Ser Lys Ala Thr Ile Arg Asp Leu
 65 70 75 80

Asn	Asp	Pro	Ser	His	Val	Lys	Thr	Leu	Gln	Glu	Lys	Ala	Gly	Lys	Gly
				85					90					95	
Ala	Gly	Thr	Val	Val	Ala	Val	Ile	Asp	Ala	Gly	Phe	Asp	Lys	Asn	His
			100					105					110		
Glu	Ala	Trp	Arg	Leu	Thr	Asp	Lys	Thr	Lys	Ala	Arg	Tyr	Gln	Ser	Lys
		115						120				125			
Glu	Asn	Leu	Glu	Lys	Ala	Lys	Lys	Glu	His	Gly	Ile	Thr	Tyr	Gly	Glu
		130				135				140					
Trp	Val	Asn	Asp	Lys	Val	Ala	Tyr	Tyr	His	Asp	Tyr	Ser	Lys	Asp	Gly
				150						155				160	
Lys	Asn	Ala	Val	Asp	Gln	Glu	His	Gly	Thr	His	Val	Ser	Gly	Ile	Leu
			165						170					175	
Ser	Gly	Asn	Ala	Pro	Ser	Glu	Met	Lys	Glu	Pro	Tyr	Arg	Leu	Glu	Gly
			180					185					190		
Ala	Met	Pro	Glu	Ala	Gln	Leu	Leu	Leu	Met	Arg	Val	Glu	Ile	Val	Asn
		195					200					205			
Gly	Leu	Ala	Asp	Tyr	Ala	Arg	Asn	Tyr	Ala	Gln	Ala	Ile	Arg	Asp	Ala
		210				215					220				
Val	Asn	Leu	Gly	Ala	Lys	Val	Ile	Asn	Met	Ser	Phe	Gly	Asn	Ala	Ala
		225			230					235				240	
Leu	Ala	Tyr	Ala	Asn	Leu	Pro	Asp	Glu	Thr	Lys	Lys	Ala	Phe	Asp	Tyr
			245					250						255	
Ala	Lys	Ser	Lys	Gly	Val	Ser	Ile	Val	Thr	Ser	Ala	Gly	Asn	Asp	Ser
			260					265					270		
Ser	Phe	Gly	Gly	Lys	Pro	Arg	Leu	Pro	Leu	Ala	Asp	His	Pro	Asp	Tyr
		275					280					285			
Gly	Val	Val	Gly	Thr	Pro	Ala	Ala	Ala	Asp	Ser	Thr	Leu	Thr	Val	Ala
	290					295					300				
Ser	Tyr	Ser	Pro	Asp	Lys	Gln	Leu	Thr	Glu	Thr	Ala	Thr	Val	Lys	Thr
				310						315				320	
Asp	Asp	His	Gln	Asp	Lys	Glu	Met	Pro	Val	Ile	Ser	Thr	Asn	Arg	Phe
			325						330					335	
Glu	Pro	Asn	Lys	Ala	Tyr	Asp	Tyr	Ala	Tyr	Ala	Asn	Arg	Gly	Thr	Lys
			340					345				350			
Glu	Asp	Asp	Phe	Lys	Asp	Val	Glu	Gly	Lys	Ile	Ala	Leu	Ile	Glu	Arg
		355				360						365			
Gly	Asp	Ile	Asp	Phe	Lys	Asp	Lys	Ile	Ala	Asn	Ala	Lys	Lys	Ala	Gly
		370				375					380				
Ala	Val	Gly	Val	Leu	Ile	Tyr	Asp	Asn	Gln	Asp	Lys	Gly	Phe	Pro	Ile
		385			390					395				400	
Glu	Leu	Pro	Asn	Val	Asp	Gln	Met	Pro	Ala	Ala	Phe	Ile	Ser	Arg	Arg
			405					410						415	
Asp	Gly	Leu	Leu	Lys	Asp	Asn	Pro	Pro	Lys	Thr	Ile	Thr	Phe	Asn	
		420				425						430			
Ala	Thr	Pro	Lys	Val	Leu	Pro	Thr	Ala	Ser	Gly	Thr	Lys	Leu	Ser	Arg
		435				440						445			
Phe	Ser	Ser	Trp	Gly	Leu	Thr	Ala	Asp	Gly	Asn	Ile	Lys	Pro	Asp	Ile
		450				455				460					
Ala	Ala	Pro	Gly	Gln	Asp	Ile	Leu	Ser	Ser	Val	Ala	Asn	Asn	Lys	Tyr
		465			470					475				480	
Ala	Lys	Leu	Ser	Gly	Thr	Ser	Met	Ser	Ala	Pro	Leu	Val	Ala	Gly	Ile
			485						490					495	
Met	Gly	Leu	Leu	Gln	Lys	Gln	Tyr	Glu	Thr	Gln	Tyr	Pro	Asp	Met	Thr
		500						505					510		
Pro	Ser	Glu	Arg	Leu	Asp	Leu	Ala	Lys	Lys	Val	Leu	Met	Ser	Ser	Ala

515				520				525							
Thr	Ala	Leu	Tyr	Asp	Glu	Asp	Glu	Lys	Ala	Tyr	Phe	Ser	Pro	Arg	Gln
530				535				540							
Gln	Gly	Ala	Gly	Ala	Val	Asp	Ala	Lys	Lys	Ala	Ser	Ala	Ala	Thr	Met
545				550				555				560			
Tyr	Val	Thr	Asp	Lys	Asp	Asn	Thr	Ser	Ser	Lys	Val	His	Leu	Asn	Asn
565				570				575				580			
Val	Ser	Asp	Lys	Phe	Glu	Val	Thr	Val	Thr	Val	His	Asn	Lys	Ser	Asp
580				585				590				595			
Lys	Pro	Gln	Glu	Leu	Tyr	Tyr	Gln	Val	Thr	Val	Gln	Thr	Asp	Lys	Val
595				600				605				610			
Asp	Gly	Lys	His	Phe	Ala	Leu	Ala	Pro	Lys	Ala	Leu	Tyr	Glu	Thr	Ser
610				615				620				625			
Trp	Gln	Lys	Ile	Thr	Ile	Pro	Ala	Asn	Ser	Ser	Lys	Gln	Val	Thr	Val
625				630				635				640			
Pro	Ile	Asp	Ala	Ser	Arg	Phe	Ser	Lys	Asp	Leu	Leu	Ala	Gln	Met	Lys
645				650				655				660			
Asn	Gly	Tyr	Phe	Leu	Glu	Gly	Phe	Val	Arg	Phe	Lys	Gln	Asp	Pro	Thr
660				665				670				675			
Lys	Glu	Glu	Leu	Met	Ser	Ile	Pro	Tyr	Ile	Gly	Phe	Arg	Gly	Asp	Phe
675				680				685				690			
Gly	Asn	Leu	Ser	Ala	Leu	Glu	Lys	Pro	Ile	Tyr	Asp	Ser	Lys	Asp	Gly
690				695				700				705			
Ser	Ser	Tyr	Tyr	His	Glu	Ala	Asn	Ser	Asp	Ala	Lys	Asp	Gln	Leu	Asp
705				710				715				720			
Gly	Asp	Gly	Leu	Gln	Phe	Tyr	Ala	Leu	Lys	Asn	Asn	Phe	Thr	Ala	Leu
725				730				735				740			
Thr	Thr	Glu	Ser	Asn	Pro	Trp	Thr	Ile	Ile	Lys	Ala	Val	Lys	Glu	Gly
740				745				750				755			
Val	Glu	Asn	Ile	Glu	Asp	Ile	Glu	Ser	Ser	Glu	Ile	Thr	Glu	Thr	Ile
755				760				765				770			
Phe	Ala	Gly	Thr	Phe	Ala	Lys	Gln	Asp	Asp	Asp	Ser	His	Tyr	Tyr	Ile
770				775				780				785			
His	Arg	His	Ala	Asn	Gly	Lys	Pro	Tyr	Ala	Ala	Ile	Ser	Pro	Asn	Gly
785				790				795				800			
Asp	Gly	Asn	Arg	Asp	Tyr	Val	Gln	Phe	Gln	Gly	Thr	Phe	Leu	Arg	Asn
805				810				815				820			
Ala	Lys	Asn	Leu	Val	Ala	Glu	Val	Leu	Asp	Lys	Glu	Gly	Asn	Val	Val
820				825				830				835			
Trp	Thr	Ser	Glu	Val	Thr	Glu	Gln	Val	Val	Lys	Asn	Tyr	Asn	Asn	Asp
835				840				845				850			
Leu	Ala	Ser	Thr	Leu	Gly	Ser	Thr	Arg	Phe	Glu	Lys	Thr	Arg	Trp	Asp
850				855				860				865			
Gly	Lys	Asp	Lys	Asp	Gly	Lys	Val	Val	Ala	Asn	Gly	Thr	Tyr	Thr	Tyr
865				870				875				880			
Arg	Val	Arg	Tyr	Thr	Pro	Ile	Ser	Ser	Gly	Ala	Lys	Glu	Gln	His	Thr
885				890				895				900			
Asp	Phe	Asp	Val	Ile	Val	Asp	Asn	Thr	Thr	Pro	Glu	Val	Ala	Thr	Ser
900				905				910				915			
Ala	Thr	Phe	Ser	Thr	Glu	Asp	Ser	Arg	Leu	Thr	Leu	Ala	Ser	Lys	Pro
915				920				925				930			
Lys	Thr	Ser	Gln	Pro	Val	Tyr	Arg	Glu	Arg	Ile	Ala	Tyr	Thr	Tyr	Met
930				935				940				945			

Asp Glu Asp Leu Pro Thr Thr Glu Tyr Ile Ser Pro Asn Glu Asp Gly
 945 950 955 960
 Thr Phe Thr Leu Pro Glu Glu Ala Glu Thr Met Glu Gly Ala Thr Val
 965 970 975
 Pro Leu Lys Met Ser Asp Phe Thr Tyr Val Val Glu Asp Met Ala Gly
 980 985 990
 Asn Ile Thr Tyr Thr Pro Val Thr Lys Leu Leu Glu Gly His Ser Asn
 995 1000 1005
 Lys Pro Glu Gln Asp Gly Ser Asp Gln Ala Pro Asp Lys Lys Pro Glu
 1010 1015 1020
 Ala Lys Pro Glu Gln Asp Gly Ser Gly Gln Thr Pro Asp Lys Lys Lys
 1025 1030 1035 1040
 Glu Thr Lys Pro Glu Lys Asp Ser Ser Gly Gln Thr Pro Gly Lys Thr
 1045 1050 1055
 Pro Gln Lys Gly Gln Ser Ser Arg Thr Leu Glu Lys Arg Ser Ser Lys
 1060 1065 1070
 Arg Ala Leu Ala Thr Lys
 1075

<210> 31

<211> 1365

<212> DNA

<213> *Streptococcus agalactiae*

<400> 31

atgggacgag	taatgaaaac	aataacaaca	tttgaataa	aaaaagtttt	agtccttggt	60
ttagcacgat	ctggagaagc	tgctgcacgt	ttgttagcta	agtttagagc	aatagtga	120
gttaaatgatg	gcaaacatt	tgatgaaat	ccaacagcac	agtctttggt	ggaagagggt	180
attaaagtgg	tttgtgtag	tcatccttta	gaattgttag	atgaggattt	ttgttacatg	240
attaaaaatc	caggaatacc	ttataacaat	cctatgggtc	aaaaagcatt	agaaaaacaa	300
atccctgttt	tgactgaagt	ggaattagca	tacttagttt	cagaatctca	gctaatagtg	360
attacaggct	ctaacgggaa	aacgacaacg	acaacgatga	ttgcagaagt	cttaaatgct	420
ggaggtcaga	gaggtttgtt	agctgggaat	atcggtcttc	ctgctagtga	agttgttcag	480
gctgcgaatg	ataaagatac	tctagttagt	gaattatcaa	gttttcagct	aatgggagtt	540
aaggaatttc	gtcctcatat	tgacgaat	actaatata	tgccaaactca	tttagattat	600
catgggtctt	ttgaagatta	tggtgctgca	aaatggaata	tccaaaaatca	aatgtcttca	660
tctgattttt	tggtacttaa	ttttaatcaa	ggatatttcta	aagagttagc	taaaactact	720
aaagcaacaa	tcgttctctt	ctctactacg	gaaaagtgtg	atgggtgctta	cgtacaagac	780
aagcaacttt	tctataaagg	ggagaatatt	atgtcagtag	atgacattgg	tgtcccagga	840
agccataacg	tagagaatgc	tctagcaact	attgcggttg	ctaaactggc	tggtatcagt	900
aatcaagtta	ttagagaaac	tttaagcaat	tttggagggt	ttaaacacgc	cttgcaatca	960
ctcggttaag	ttcatggtat	tagtttctat	aacgacagca	agtcacactaa	tatatgtggca	1020
actcaaaaag	cattatctgg	ctttgataat	actaaagtta	tcctaatgac	aggaggtctt	1080
gatcgcggtta	atgagtttga	tgaattgata	ccagatatca	ctggacttaa	acatatgggt	1140
gttttagggg	aatcggcatc	tcgagtaaaa	cgtgctgcac	aaaaagcagg	agtaacttat	1200
agcgatgctt	tagatgttag	agatgcggta	cataaagctt	atgaggtggc	acaacagggc	1260
gatgtgttct	tgctaagtc	tgcaaatgca	tcatgggaca	tgtataagaa	tttcgaagtc	1320
cgtggtgatg	aattcattga	tacttttcgaa	agtcttagag	gagag		1365

<210> 32

<211> 455

<212> PRT

<213> *Streptococcus agalactiae*

<400> 32

Met	Gly	Arg	Val	Met	Lys	Thr	Ile	Thr	Thr	Phe	Glu	Asn	Lys	Lys	Val
1				5				10						15	
Leu	Val	Leu	Gly	Leu	Ala	Arg	Ser	Gly	Glu	Ala	Ala	Ala	Arg	Leu	Leu
		20						25					30		
Ala	Lys	Leu	Gly	Ala	Ile	Val	Thr	Val	Asn	Asp	Gly	Lys	Pro	Phe	Asp
		35					40					45			
Glu	Asn	Pro	Thr	Ala	Gln	Ser	Leu	Leu	Glu	Glu	Gly	Ile	Lys	Val	Val
	50					55					60				
Cys	Gly	Ser	His	Pro	Leu	Glu	Leu	Leu	Asp	Glu	Asp	Phe	Cys	Tyr	Met
65				70						75				80	
Ile	Lys	Asn	Pro	Gly	Ile	Pro	Tyr	Asn	Asn	Pro	Met	Val	Lys	Lys	Ala
				85				90					95		
Leu	Glu	Lys	Gln	Ile	Pro	Val	Leu	Thr	Glu	Val	Glu	Leu	Ala	Tyr	Leu
		100						105					110		
Val	Ser	Glu	Ser	Gln	Leu	Ile	Gly	Ile	Thr	Gly	Ser	Asn	Gly	Lys	Thr
		115					120					125			
Thr	Thr	Thr	Thr	Met	Ile	Ala	Glu	Val	Leu	Asn	Ala	Gly	Gly	Gln	Arg
	130					135					140				
Gly	Leu	Leu	Ala	Gly	Asn	Ile	Gly	Phe	Pro	Ala	Ser	Glu	Val	Val	Gln
145				150						155				160	
Ala	Ala	Asn	Asp	Lys	Asp	Thr	Leu	Val	Met	Glu	Leu	Ser	Ser	Phe	Gln
				165					170					175	
Leu	Met	Gly	Val	Lys	Glu	Phe	Arg	Pro	His	Ile	Ala	Val	Ile	Thr	Asn
		180						185					190		
Leu	Met	Pro	Thr	His	Leu	Asp	Tyr	His	Gly	Ser	Phe	Glu	Asp	Tyr	Val
		195					200					205			
Ala	Ala	Lys	Trp	Asn	Ile	Gln	Asn	Gln	Met	Ser	Ser	Ser	Asp	Phe	Leu
	210					215					220				
Val	Leu	Asn	Phe	Asn	Gln	Gly	Ile	Ser	Lys	Glu	Leu	Ala	Lys	Thr	Thr
225				230						235				240	
Lys	Ala	Thr	Ile	Val	Pro	Phe	Ser	Thr	Thr	Glu	Lys	Val	Asp	Gly	Ala
				245						250				255	
Tyr	Val	Gln	Asp	Lys	Gln	Leu	Phe	Tyr	Lys	Gly	Glu	Asn	Ile	Met	Ser
			260					265					270		
Val	Asp	Asp	Ile	Gly	Val	Pro	Gly	Ser	His	Asn	Val	Glu	Asn	Ala	Leu
		275					280					285			
Ala	Thr	Ile	Ala	Val	Ala	Lys	Leu	Ala	Gly	Ile	Ser	Asn	Gln	Val	Ile
	290					295					300				
Arg	Glu	Thr	Leu	Ser	Asn	Phe	Gly	Gly	Val	Lys	His	Arg	Leu	Gln	Ser
305				310						315				320	
Leu	Gly	Lys	Val	His	Gly	Ile	Ser	Phe	Tyr	Asn	Asp	Ser	Lys	Ser	Thr
				325					330					335	
Asn	Ile	Leu	Ala	Thr	Gln	Lys	Ala	Leu	Ser	Gly	Phe	Asp	Asn	Thr	Lys
		340						345					350		
Val	Ile	Leu	Ile	Ala	Gly	Gly	Leu	Asp	Arg	Gly	Asn	Glu	Phe	Asp	Glu
		355					360					365			
Leu	Ile	Pro	Asp	Ile	Thr	Gly	Leu	Lys	His	Met	Val	Val	Leu	Gly	Glu
		370				375					380				
Ser	Ala	Ser	Arg	Val	Lys	Arg	Ala	Ala	Gln	Lys	Ala	Gly	Val	Thr	Tyr
385				390						395				400	
Ser	Asp	Ala	Leu	Asp	Val	Arg	Asp	Ala	Val	His	Lys	Ala	Tyr	Glu	Val
				405				410						415	
Ala	Gln	Gln	Gly	Asp	Val	Ile	Leu	Leu	Ser	Pro	Ala	Asn	Ala	Ser	Trp
			420					425					430		

Asp Met Tyr Lys Asn Phe Glu Val Arg Gly Asp Glu Phe Ile Asp Thr
 435 440 445
 Phe Glu Ser Leu Arg Gly Glu
 450 455

<210> 33
 <211> 448
 <212> PRT
 <213> Streptococcus agalactiae

<400> 33
 Ile Thr Thr Phe Glu Asn Lys Lys Val Leu Val Leu Gly Leu Ala Arg
 1 5 10 15
 Ser Gly Glu Ala Ala Arg Leu Leu Ala Lys Leu Gly Ala Ile Val
 20 25 30
 Thr Val Asn Asp Gly Lys Pro Phe Asp Glu Asn Pro Thr Ala Gln Ser
 35 40 45
 Leu Leu Glu Glu Gly Ile Lys Val Val Cys Gly Ser His Pro Leu Glu
 50 55 60
 Leu Leu Asp Glu Asp Phe Cys Tyr Met Ile Lys Asn Pro Gly Ile Pro
 65 70 75 80
 Tyr Asn Asn Pro Met Val Lys Lys Ala Leu Glu Lys Gln Ile Pro Val
 85 90 95
 Leu Thr Glu Val Glu Leu Ala Tyr Leu Val Ser Glu Ser Gln Leu Ile
 100 105 110
 Gly Ile Thr Gly Ser Asn Gly Lys Thr Thr Thr Thr Thr Met Ile Ala
 115 120 125
 Glu Val Leu Asn Ala Gly Gly Gln Arg Gly Leu Leu Ala Gly Asn Ile
 130 135 140
 Gly Phe Pro Ala Ser Glu Val Val Gln Ala Ala Asn Asp Lys Asp Thr
 145 150 155 160
 Leu Val Met Glu Leu Ser Ser Phe Gln Leu Met Gly Val Lys Glu Phe
 165 170 175
 Arg Pro His Ile Ala Val Ile Thr Asn Leu Met Pro Thr His Leu Asp
 180 185 190
 Tyr His Gly Ser Phe Glu Asp Tyr Val Ala Ala Lys Trp Asn Ile Gln
 195 200 205
 Asn Gln Met Ser Ser Ser Asp Phe Leu Val Leu Asn Phe Asn Gln Gly
 210 215 220
 Ile Ser Lys Glu Leu Ala Lys Thr Thr Lys Ala Thr Ile Val Pro Phe
 225 230 235 240
 Ser Thr Thr Glu Lys Val Asp Gly Ala Tyr Val Gln Asp Lys Gln Leu
 245 250 255
 Phe Tyr Lys Gly Glu Asn Ile Met Ser Val Asp Asp Ile Gly Val Pro
 260 265 270
 Gly Ser His Asn Val Glu Asn Ala Leu Ala Thr Ile Ala Val Ala Lys
 275 280 285
 Leu Ala Gly Ile Ser Asn Gln Val Ile Arg Glu Thr Leu Ser Asn Phe
 290 295 300
 Gly Gly Val Lys His Arg Leu Gln Ser Leu Gly Lys Val His Gly Ile
 305 310 315 320
 Ser Phe Tyr Asn Asp Ser Lys Ser Thr Asn Ile Leu Ala Thr Gln Lys
 325 330 335
 Ala Leu Ser Gly Phe Asp Asn Thr Lys Val Ile Leu Ile Ala Gly Gly

340 345 350
 Leu Asp Arg Gly Asn Glu Phe Asp Glu Leu Ile Pro Asp Thr Gly
 355 360 365
 Leu Lys His Met Val Val Leu Gly Glu Ser Ala Ser Arg Val Lys Arg
 370 375 380
 Ala Ala Gln Lys Ala Gly Val Thr Tyr Ser Asp Ala Leu Asp Val Arg
 385 390 395 400
 Asp Ala Val His Lys Ala Tyr Glu Val Ala Gln Gln Gly Asp Val Ile
 405 410 415
 Leu Leu Ser Pro Ala Asn Ala Ser Trp Asp Met Tyr Lys Asn Phe Glu
 420 425 430
 Val Arg Gly Asp Glu Phe Ile Asp Thr Phe Glu Ser Leu Arg Gly Glu
 435 440 445

<210> 34

<211> 334

<212> PRT

<213> Streptococcus agalactiae

<400> 34

Met Gly Arg Val Met Lys Thr Ile Thr Thr Phe Glu Asn Lys Lys Val
 1 5 10 15
 Leu Val Leu Gly Leu Ala Arg Ser Gly Glu Ala Ala Arg Leu Leu
 20 25 30
 Ala Lys Leu Gly Ala Ile Val Thr Val Asn Asp Gly Lys Pro Phe Asp
 35 40 45
 Glu Asn Pro Thr Ala Gln Ser Leu Leu Glu Glu Gly Ile Lys Val Val
 50 55 60
 Cys Gly Ser His Pro Leu Glu Leu Leu Asp Glu Asp Phe Cys Tyr Met
 65 70 75 80
 Ile Lys Asn Pro Gly Ile Pro Tyr Asn Asn Pro Met Val Lys Lys Ala
 85 90 95
 Leu Glu Lys Gln Ile Pro Val Leu Thr Glu Val Glu Leu Ala Tyr Leu
 100 105 110
 Val Ser Glu Ser Gln Leu Ile Gly Ile Thr Gly Ser Asn Gly Lys Thr
 115 120 125
 Thr Thr Thr Thr Met Ile Ala Glu Val Leu Asn Ala Gly Gly Gln Arg
 130 135 140
 Gly Leu Leu Ala Gly Asn Ile Gly Phe Pro Ala Ser Glu Val Val Gln
 145 150 155 160
 Ala Ala Asn Asp Lys Asp Thr Leu Val Met Glu Leu Ser Ser Phe Gln
 165 170 175
 Leu Met Gly Val Lys Glu Phe Arg Pro His Ile Ala Val Ile Thr Asn
 180 185 190
 Leu Met Pro Thr His Leu Asp Tyr His Gly Ser Phe Glu Asp Tyr Val
 195 200 205
 Ala Ala Lys Trp Asn Ile Gln Asn Gln Met Ser Ser Ser Asp Phe Leu
 210 215 220
 Val Leu Asn Phe Asn Gln Gly Ile Ser Lys Glu Leu Ala Lys Thr Thr
 225 230 235 240
 Lys Ala Thr Ile Val Pro Phe Ser Thr Thr Glu Lys Val Asp Gly Ala
 245 250 255
 Tyr Val Gln Asp Lys Gln Leu Phe Tyr Lys Gly Glu Asn Ile Met Ser
 260 265 270
 Val Asp Asp Ile Gly Val Pro Gly Ser His Asn Val Glu Asn Ala Leu

275 280 285
 Ala Thr Ile Ala Val Ala Lys Leu Ala Gly Ile Ser Asn Gln Val Ile
 290 295 300
 Arg Glu Thr Leu Ser Asn Phe Gly Gly Val Lys His Arg Leu Gln Ser
 305 310 315
 Leu Gly Lys Val His Gly Ile Ser Phe Tyr Asn Asp Ser Lys
 325 330

<210> 35
 <211> 327
 <212> PRT
 <213> Streptococcus agalactiae

<400> 35
 Ile Thr Thr Phe Glu Asn Lys Lys Val Leu Val Leu Gly Leu Ala Arg
 1 5 10 15
 Ser Gly Glu Ala Ala Ala Arg Leu Leu Ala Lys Leu Gly Ala Ile Val
 20 25 30
 Thr Val Asn Asp Gly Lys Pro Phe Asp Glu Asn Pro Thr Ala Gln Ser
 35 40 45
 Leu Leu Glu Glu Gly Ile Lys Val Val Cys Gly Ser His Pro Leu Glu
 50 55 60
 Leu Leu Asp Glu Asp Phe Cys Tyr Met Ile Lys Asn Pro Gly Ile Pro
 65 70 75 80
 Tyr Asn Asn Pro Met Val Lys Lys Ala Leu Glu Lys Gln Ile Pro Val
 85 90 95
 Leu Thr Glu Val Glu Leu Ala Tyr Leu Val Ser Glu Ser Gln Leu Ile
 100 105 110
 Gly Ile Thr Gly Ser Asn Gly Lys Thr Thr Thr Thr Thr Met Ile Ala
 115 120 125
 Glu Val Leu Asn Ala Gly Gly Gln Arg Gly Leu Leu Ala Gly Asn Ile
 130 135 140
 Gly Phe Pro Ala Ser Glu Val Val Gln Ala Ala Asn Asp Lys Asp Thr
 145 150 155 160
 Leu Val Met Glu Leu Ser Ser Phe Gln Leu Met Gly Val Lys Glu Phe
 165 170 175
 Arg Pro His Ile Ala Val Ile Thr Asn Leu Met Pro Thr His Leu Asp
 180 185 190
 Tyr His Gly Ser Phe Glu Asp Tyr Val Ala Ala Lys Trp Asn Ile Gln
 195 200 205
 Asn Gln Met Ser Ser Ser Asp Phe Leu Val Leu Asn Phe Asn Gln Gly
 210 215 220
 Ile Ser Lys Glu Leu Ala Lys Thr Thr Lys Ala Thr Ile Val Pro Phe
 225 230 235 240
 Ser Thr Thr Glu Lys Val Asp Gly Ala Tyr Val Gln Asp Lys Gln Leu
 245 250 255
 Phe Tyr Lys Gly Glu Asn Ile Met Ser Val Asp Asp Ile Gly Val Pro
 260 265 270
 Gly Ser His Asn Val Glu Asn Ala Leu Ala Thr Ile Ala Val Ala Lys
 275 280 285
 Leu Ala Gly Ile Ser Asn Gln Val Ile Arg Glu Thr Leu Ser Asn Phe
 290 295 300
 Gly Gly Val Lys His Arg Leu Gln Ser Leu Gly Lys Val His Gly Ile
 305 310 315 320
 Ser Phe Tyr Asn Asp Ser Lys

<210> 36
 <211> 1376
 <212> DNA
 <213> Streptococcus agalactiae

<400> 36
 atgaataaaa aggtactatt gacatcgaca atggcagctt cgctattatc agtcgcaagt 60
 gttcaagcac aagaaacaga tacgacgtgg acagcacgta ctgtttcaga ggtaaaggct 120
 gattttgtaa agcaagacaa taaatcatca tatactgtga aatatgggtga tacactaagc 180
 gttatttcag aagcaatgtc aattgatatg aatgtcttag caaaaataaa taacattgca 240
 gatatacaatc ttatttatcc tgagacaaca ctgacagtaa cttacgatca gaagagtcac 300
 actgcccactt caatgaaaat agaaacacca gcaacaaatg ctgctgggtca aacaacagct 360
 actgtggatt tgaaaaccaa tcaagtttct gttgcagacc aaaaagtgtc tctcaataca 420
 atttcggaag gtagacacc agaagcagca acaacgattg ttccgccaat gaagacatat 480
 tcttctgcgc cagctttgaa atcaaaagaa gtattagcac aagagcaagc tgttagtcaa 540
 gcagcagcta atgaacaggt atcaccagct cctgtgaagt cgattacttc agaagtcca 600
 gcagctaaag aggaaggttaa accaactcag acgtcagtc gtcagtcaac aacagtatca 660
 ccagcttctg ttgccgtgta aacaccagct ccagtagcta aagtagcacc ggtaagaact 720
 gtacgagccc cttaggtggc aagtgttaaa gtagtcaact ctaaagtaga aactgggtgca 780
 tcaccagagc atgtatcagc tccagcagtt cctgtgacta cgacttcacc agctacagac 840
 agtaagttac aagcgactga agttaagagc gttccggtag cacaaaaagc tccaacagca 900
 acaccggtag cacaaccaga ttcaacaaca aatgcagtag ctgcacatcc tgaataatgca 960
 gggctccaac ctcatgttgc agcttataaa gaaaaagtag cgtcaactta tggaggtaat 1020
 gaattacgta cataccgtgc gggagatcca ggtgatcatg tgaagggttt acgagttgac 1080

ttttattgtag gtactaatca agcacttggt aataaagttg cacagtactc tacacaaaaat 1140
 atggcagcaa ataactttc atatgttatc tggcaacaaa agttttactc aaatacaaac 1200
 agtatttatg gacctgtcaa tacttggaat gcaatgccag atcgtgggtg cgttactgccc 1260
 aaccactatg accacgttca cgtatcattt aacaaataat ataaaaaag agctattttg 1320
 gcttcttttt tatatgcctt gaatagactt tcaaggttct tatataattt ttatta 1376

<210> 37
 <211> 432
 <212> PRT
 <213> Streptococcus agalactiae

<400> 37
 Met Asn Lys Lys Val Leu Leu Thr Ser Thr Met Ala Ala Ser Leu Leu
 1 5 10 15
 Ser Val Ala Ser Val Gln Ala Gln Glu Thr Asp Thr Thr Trp Thr Ala
 20 25 30
 Arg Thr Val Ser Glu Val Lys Ala Asp Leu Val Lys Gln Asp Asn Lys
 35 40 45
 Ser Ser Tyr Thr Val Lys Tyr Gly Asp Thr Leu Ser Val Ile Ser Glu
 50 55 60
 Ala Met Ser Ile Asp Met Asn Val Leu Ala Lys Ile Asn Asn Ile Ala
 65 70 75 80
 Asp Ile Asn Leu Ile Tyr Pro Glu Thr Thr Leu Thr Val Thr Tyr Asp
 85 90 95
 Gln Lys Ser His Thr Ala Thr Ser Met Lys Ile Glu Thr Pro Ala Thr
 100 105 110
 Asn Ala Ala Gly Gln Thr Thr Ala Thr Val Asp Leu Lys Thr Asn Gln
 115 120 125

Val Ser Val Ala Asp Gln Lys Val Ser Leu Asn Thr Ile Ser Glu Gly
 130 135 140
 Met Thr Pro Glu Ala Ala Thr Thr Ile Val Ser Pro Met Lys Thr Tyr
 145 150 155 160
 Ser Ser Ala Pro Ala Leu Lys Ser Lys Glu Val Leu Ala Gln Glu Gln
 165 170 175
 Ala Val Ser Gln Ala Ala Ala Asn Glu Gln Val Ser Pro Ala Pro Val
 180 185 190
 Lys Ser Ile Thr Ser Glu Val Pro Ala Ala Lys Glu Glu Val Lys Pro
 195 200 205
 Thr Gln Thr Ser Val Ser Gln Ser Thr Thr Val Ser Pro Ala Ser Val
 210 215 220
 Ala Ala Glu Thr Pro Ala Pro Val Ala Lys Val Ala Pro Val Arg Thr
 225 230 235 240
 Val Ala Ala Pro Arg Val Ala Ser Val Lys Val Val Thr Pro Lys Val
 245 250 255
 Glu Thr Gly Ala Ser Pro Glu His Val Ser Ala Pro Ala Val Pro Val
 260 265 270
 Thr Thr Thr Ser Pro Ala Thr Asp Ser Lys Leu Gln Ala Thr Glu Val
 275 280 285
 Lys Ser Val Pro Val Ala Gln Lys Ala Pro Thr Ala Thr Pro Val Ala
 290 295 300
 Gln Pro Ala Ser Thr Thr Asn Ala Val Ala Ala His Pro Glu Asn Ala
 305 310 315 320
 Gly Leu Gln Pro His Val Ala Ala Tyr Lys Glu Lys Val Ala Ser Thr
 325 330 335
 Tyr Gly Val Asn Glu Phe Ser Thr Tyr Arg Ala Gly Asp Pro Gly Asp
 340 345 350
 His Gly Lys Gly Leu Ala Val Asp Phe Ile Val Gly Thr Asn Gln Ala
 355 360 365
 Leu Gly Asn Lys Val Ala Gln Tyr Ser Thr Gln Asn Met Ala Ala Asn
 370 375 380
 Asn Ile Ser Tyr Val Ile Trp Gln Gln Lys Phe Tyr Ser Asn Thr Asn
 385 390 395 400
 Ser Ile Tyr Gly Pro Ala Asn Thr Trp Asn Ala Met Pro Asp Arg Gly
 405 410 415
 Gly Val Thr Ala Asn His Tyr Asp His Val His Val Ser Phe Asn Lys
 420 425 430

<210> 38

<211> 392

<212> PRT

<213> Streptococcus agalactiae

<400> 38

Asp Leu Val Lys Gln Asp Asn Lys Ser Ser Tyr Thr Val Lys Tyr Gly
 1 5 10 15
 Asp Thr Leu Ser Val Ile Ser Glu Ala Met Ser Ile Asp Met Asn Val
 20 25 30
 Leu Ala Lys Ile Asn Asn Ile Ala Asp Ile Asn Leu Ile Tyr Pro Glu
 35 40 45
 Thr Thr Leu Thr Val Thr Tyr Asp Gln Lys Ser His Thr Ala Thr Ser
 50 55 60
 Met Lys Ile Glu Thr Pro Ala Thr Asn Ala Ala Gly Gln Thr Thr Ala
 65 70 75 80

Thr Val Asp Leu Lys Thr Asn Gln Val Ser Val Ala Asp Gln Lys Val
 85 90 95
 Ser Leu Asn Thr Ile Ser Glu Gly Met Thr Pro Glu Ala Ala Thr Thr
 100 105 110
 Ile Val Ser Pro Met Lys Thr Tyr Ser Ser Ala Pro Ala Leu Lys Ser
 115 120 125
 Lys Glu Val Leu Ala Gln Glu Gln Ala Val Ser Gln Ala Ala Ala Asn
 130 135 140
 Glu Gln Val Ser Pro Ala Pro Val Lys Ser Ile Thr Ser Glu Val Pro
 145 150 155 160
 Ala Ala Lys Glu Glu Val Lys Pro Thr Gln Thr Ser Val Ser Gln Ser
 165 170 175
 Thr Thr Val Ser Pro Ala Ser Val Ala Ala Glu Thr Pro Ala Pro Val
 180 185 190
 Ala Lys Val Ala Pro Val Arg Thr Val Ala Ala Pro Arg Val Ala Ser
 195 200 205
 Val Lys Val Val Thr Pro Lys Val Glu Thr Gly Ala Ser Pro Glu His
 210 215 220
 Val Ser Ala Pro Ala Val Pro Val Thr Thr Thr Ser Pro Ala Thr Asp
 225 230 235 240
 Ser Lys Leu Gln Ala Thr Glu Val Lys Ser Val Pro Val Ala Gln Lys
 245 250 255
 Ala Pro Thr Ala Thr Pro Val Ala Gln Pro Ala Ser Thr Thr Asn Ala
 260 265 270
 Val Ala Ala His Pro Glu Asn Ala Gly Leu Gln Pro His Val Ala Ala
 275 280 285
 Tyr Lys Glu Lys Val Ala Ser Thr Tyr Gly Val Asn Glu Phe Ser Thr
 290 295 300
 Tyr Arg Ala Gly Asp Pro Gly Asp His Gly Lys Gly Leu Ala Val Asp
 305 310 315 320
 Phe Ile Val Gly Thr Asn Gln Ala Leu Gly Asn Lys Val Ala Gln Tyr
 325 330 335
 Ser Thr Gln Asn Met Ala Ala Asn Asn Ile Ser Tyr Val Ile Trp Gln
 340 345 350
 Gln Lys Phe Tyr Ser Asn Thr Asn Ser Ile Tyr Gly Pro Ala Asn Thr
 355 360 365
 Trp Asn Ala Met Pro Asp Arg Gly Gly Val Thr Ala Asn His Tyr Asp
 370 375 380
 His Val His Val Ser Phe Asn Lys
 385 390

<210> 39

<211> 1500

<212> DNA

<213> *Streptococcus agalactiae*

<400> 39

atgaataaac	gcgtaaaaat	cgttgcaaca	cttggtcctg	cgggtgaatt	csgtgggtgg	60
aagaagtttg	gtgagctcgg	atactggggg	gaaagccttg	acgtagaagc	ttcagcagaa	120
aaaattgctc	aattgattaa	agaaggtgct	aacgttttcc	gtttcaactt	ctcacatgga	180
gatcatgctg	agcaaggagc	tcgtatggct	actgttcgta	aagcagaaga	gattgcagga	240
caaaaagttg	gcttcctcct	tgatactaaa	ggacctgaaa	ttcgtaacaga	actttttgaa	300
gatggtgcag	atcttcattc	atatacaaca	ggtacaaaaa	tacgtgtgtc	tactaaagcaa	360
ggtatacaat	caactccaga	agtgattgca	ttgaatgttg	ctgggtggact	tgacatcttt	420
gatgcagctg	aagttggtaa	gcaaatcctt	gttgatgatg	gtaaactag	tcttactgtg	480


```

tttgcaaaag ataaagacac tcgtgaattt gaagtagttg ttgagaatga tggccttatt 540
ggtaaaaaaa aaggtgtaaa catcccttat actaaaattc ctttccagc acttgcagaa 600
cgcgataatg ctgatatacg ttttggactt gagcaaggac ttaactttat tgctatctca 660
tttgtagcta ctgctaaaaga tgttaatgaa gttcgtgcta tttgtgaaga aactggsmat 720
ggacacgtta agttgtttgc taaaattgaa aatcaacaag gtatcgataa tattgatgag 780
attatcgaag cagcagatgg tattatgatt gctcgtgggt atatgggtat cgaagttcca 840
tttgaatgg ttccagttta ccaaaaaatg atcattacta aagttaatgc agctggtaaa 900
gcagttatta cagcaacaaa tatgcttgaa acaatgactg ataaaccacg tgcgactcgt 960
tcagaagtat ctgatgtctt caatgctgtt attgatggta ctgatgctac aatgctttca 1020
ggtgagtcag ctaattggtaa ataccaggtt gagtcagttc gtacaatggc tactattgat 1080
aaaaatgctc aaacattact caatgagtat ggtcgtctag actcatctgc attcccacgt 1140
aataacaaaa ctgatgttat tgcattctcg gttaaagatg caacacactc aatggatatc 1200
aaactgtttg taacaattac tgaacacaggt aatacagctc gtgccatttc taaattccgt 1260
ccagatgcag acattttggc tgttacattt gatgaaaaag tacaaactgc attgatgatt 1320
aactgggggt ttaaccctgt ccttgcagac aaaccagcat ctacagatga tatgtttgag 1380
gttcagaaac gtgtagcact tgaagcagga tttgttgaat caggcgataa ttcggtatc 1440
gttcgaggtg ttctgttagg tacaggtgga actaacacaa tgcgtgttcg tactgttaaa 1500

```

```

<210> 40
<211> 500
<212> PRT
<213> Streptococcus agalactiae

```

```

<220>
<221> VARIANT
<222> (1)...(500)
<223> Xaa = Any Amino Acid

```

```

<400> 40
Met Asn Lys Arg Val Lys Ile Val Ala Thr Leu Gly Pro Ala Val Glu
1 5 10 15
Phe Arg Gly Gly Lys Lys Phe Gly Glu Ser Gly Tyr Trp Gly Glu Ser
20 25 30
Leu Asp Val Glu Ala Ser Ala Glu Lys Ile Ala Gln Leu Ile Lys Glu
35 40 45
Gly Ala Asn Val Phe Arg Phe Asn Phe Ser His Gly Asp His Ala Glu
50 55 60
Gln Gly Ala Arg Met Ala Thr Val Arg Lys Ala Glu Glu Ile Ala Gly
65 70 75 80
Gln Lys Val Gly Phe Leu Leu Asp Thr Lys Gly Pro Glu Ile Arg Thr
85 90 95
Glu Leu Phe Glu Asp Gly Ala Asp Phe His Ser Tyr Thr Thr Gly Thr
100 105 110
Lys Leu Arg Val Ala Thr Lys Gln Gly Ile Lys Ser Thr Pro Glu Val
115 120 125
Ile Ala Leu Asn Val Ala Gly Gly Leu Asp Ile Phe Asp Asp Val Glu
130 135 140
Val Gly Lys Gln Ile Leu Val Asp Asp Gly Lys Leu Gly Leu Thr Val
145 150 155 160
Phe Ala Lys Asp Lys Asp Thr Arg Glu Phe Glu Val Val Val Glu Asn
165 170 175
Asp Gly Leu Ile Gly Lys Gln Lys Gly Val Asn Ile Pro Tyr Thr Lys
180 185 190
Ile Pro Phe Pro Ala Leu Ala Glu Arg Asp Asn Ala Asp Ile Arg Phe
195 200 205

```

Gly Leu Glu Gln Gly Leu Asn Phe Ile Ala Ile Ser Phe Val Arg Thr
 210 215 220
 Ala Lys Asp Val Asn Glu Val Arg Ala Ile Cys Glu Glu Thr Gly Xaa
 225 230 235 240
 Gly His Val Lys Leu Phe Ala Lys Ile Glu Asn Gln Gln Gly Ile Asp
 245 250 255
 Asn Ile Asp Glu Ile Ile Glu Ala Ala Asp Gly Ile Met Ile Ala Arg
 260 265 270
 Gly Asp Met Gly Ile Glu Val Pro Phe Glu Met Val Pro Val Tyr Gln
 275 280 285
 Lys Met Ile Ile Thr Lys Val Asn Ala Ala Gly Lys Ala Val Ile Thr
 290 295 300
 Ala Thr Asn Met Leu Glu Thr Met Thr Asp Lys Pro Arg Ala Thr Arg
 305 310 315 320
 Ser Glu Val Ser Asp Val Phe Asn Ala Val Ile Asp Gly Thr Asp Ala
 325 330 335
 Thr Met Leu Ser Gly Glu Ser Ala Asn Gly Lys Tyr Pro Val Glu Ser
 340 345 350
 Val Arg Thr Met Ala Thr Ile Asp Lys Asn Ala Gln Thr Leu Leu Asn
 355 360 365
 Glu Tyr Gly Arg Leu Asp Ser Ser Ala Phe Pro Arg Asn Asn Lys Thr
 370 375 380
 Asp Val Ile Ala Ser Ala Val Lys Asp Ala Thr His Ser Met Asp Ile
 385 390 395 400
 Lys Leu Val Val Thr Ile Thr Glu Thr Gly Asn Thr Ala Arg Ala Ile
 405 410 415
 Ser Lys Phe Arg Pro Asp Ala Asp Ile Leu Ala Val Thr Phe Asp Glu
 420 425 430
 Lys Val Gln Arg Ser Leu Met Ile Asn Trp Gly Val Ile Pro Val Leu
 435 440 445
 Ala Asp Lys Pro Ala Ser Thr Asp Asp Met Phe Glu Val Ala Glu Arg
 450 455 460
 Val Ala Leu Glu Ala Gly Phe Val Glu Ser Gly Asp Asn Ile Val Ile
 465 470 475 480
 Val Ala Gly Val Pro Val Gly Thr Gly Gly Thr Asn Thr Met Arg Val
 485 490 495
 Arg Thr Val Lys
 500

<210> 41
 <211> 720
 <212> DNA
 <213> Streptococcus agalactiae

<400> 41
 ttgtctgcta taatagacaa aaaggtggtg atatttatgt atttagcatt aatcgggtgat 60
 atcattaatt caaaacagat acttgaacgt gaaactttcc aacagtcttt tcagcaacta 120
 atgaccgaac tatctgatgt atatggtgaa gagctgattt ctccattcac tattacagct 180
 ggtgatgaat ttcaagcttt attgaaacca tcaaaaaaagg tatttcaaat tattgacct 240
 attcaactag ctctaaaacc tgttaatgta aggttcggcc tcggtacagg aaacattata 300
 acatccatca attcaaatga aagtatcggt gctgatggtc ctgcctactg gcactgtcgc 360
 tcagctatta atcatatata tgataaaaat gattatggaa cagttcaagt agctatttgc 420
 ctgcatgatg aagacacaaa ccttgaatta acactaaaata gtctcatttc agctggtgat 480
 ttatcaagt caaaatggac tacaacccat ttccaatgc ttgagcactt aatacttcaa 540
 gataattatc aagaacaatt tcaacatcaa aagttagccc aactggaaaa tattgaacct 600

agtgcgctga ctaaagcgcct taaagcaagc ggtctgaaga ttacttaag aacgagaaca
caggcagccg atctattagt taaaagttgc actcaaaacta aagggggaag ctatgatttc

660
720

<210> 42
<211> 240
<212> PRT
<213> Streptococcus agalactiae

<400> 42
Met Ser Ala Ile Ile Asp Lys Lys Val Val Ile Phe Met Tyr Leu Ala
1 5 10 15
Leu Ile Gly Asp Ile Ile Asn Ser Lys Gln Ile Leu Glu Arg Glu Thr
20 25 30
Phe Gln Gln Ser Phe Gln Gln Leu Met Thr Glu Leu Ser Asp Val Tyr
35 40 45
Gly Glu Glu Leu Ile Ser Pro Phe Thr Ile Thr Ala Gly Asp Glu Phe
50 55 60
Gln Ala Leu Leu Lys Pro Ser Lys Lys Val Phe Gln Ile Ile Asp His
65 70 75 80
Ile Gln Leu Ala Leu Lys Pro Val Asn Val Arg Phe Gly Leu Gly Thr
85 90 95
Gly Asn Ile Ile Thr Ser Ile Asn Ser Asn Glu Ser Ile Gly Ala Asp
100 105 110
Gly Pro Ala Tyr Trp His Ala Arg Ser Ala Ile Asn His Ile His Asp
115 120 125
Lys Asn Asp Tyr Gly Thr Val Gln Val Ala Ile Cys Leu Asp Asp Glu
130 135 140
Asp Gln Asn Leu Glu Leu Thr Leu Asn Ser Leu Ile Ser Ala Gly Asp
145 150 155 160
Phe Ile Lys Ser Lys Trp Thr Thr Asn His Phe Gln Met Leu Glu His
165 170 175
Leu Ile Leu Gln Asp Asn Tyr Gln Glu Gln Phe Gln His Gln Lys Leu
180 185 190
Ala Gln Leu Glu Asn Ile Glu Pro Ser Ala Leu Thr Lys Arg Leu Lys
195 200 205
Ala Ser Gly Leu Lys Ile Tyr Leu Arg Thr Arg Thr Gln Ala Ala Asp
210 215 220
Leu Leu Val Lys Ser Cys Thr Gln Thr Lys Gly Gly Ser Tyr Asp Phe
225 230 235 240

<210> 43
<211> 228
<212> PRT
<213> Streptococcus agalactiae

<400> 43
Met Tyr Leu Ala Leu Ile Gly Asp Ile Ile Asn Ser Lys Gln Ile Leu
1 5 10 15
Glu Arg Glu Thr Phe Gln Gln Ser Phe Gln Gln Leu Met Thr Glu Leu
20 25 30
Ser Asp Val Tyr Gly Glu Glu Leu Ile Ser Pro Phe Thr Ile Thr Ala
35 40 45
Gly Asp Glu Phe Gln Ala Leu Leu Lys Pro Ser Lys Lys Val Phe Gln
50 55 60
Ile Ile Asp His Ile Gln Leu Ala Leu Lys Pro Val Asn Val Arg Phe


```

atttcgacaa atagtggagc gcttgatggt atacaatatg ccaaggaagt gatgcgtaac 1680
gataatctag actatgtgat tcttgtttct gctaatacagt ggacagacat gagtttttatg 1740
tggtgggcaac aattaaacta tgatagtcac atgtttgtcgt gttctgatta ttgttcagca 1800
caagtctctc ctggtcaagc attggataat tctcctataa tattaggtag taaacaatta 1860
aaatatagcc ataaaacatt cacagatgtg atgactatct ttgatgctgc gcttcaaaat 1920
ttattatcag acttaggact aaccataaaa gatatcaaag gtttcgtttg gaatgagcgg 1980
aagaaggcag ttagtctaga ttatgatttc ttagcgaaact tgtctgagta ttataatatg 2040
ccaaaccttg cttctggcca gtttggattt tcactcaatg gtgctggtga agaactggac 2100
tatactgta atgaaagtat agaaaagggc tattatttag tcctatctta ttcgatcttc 2160
ggtgttatct cttttgctat tattgaaaaa agg 2193

```

```

<210> 45
<211> 731
<212> PRT
<213> Streptococcus agalactiae

```

```

<400> 45
Met Ser Val Tyr Val Ser Gly Ile Gly Ile Ile Ser Ser Leu Gly Lys
1 5 10 15
Asn Tyr Ser Glu His Lys Gln His Leu Phe Asp Leu Lys Glu Gly Ile
20 25 30
Ser Lys His Leu Tyr Lys Asn His Asp Ser Ile Leu Glu Ser Tyr Thr
35 40 45
Gly Ser Ile Thr Ser Asp Pro Glu Val Pro Glu Gln Tyr Lys Asp Glu
50 55 60
Thr Arg Asn Phe Lys Phe Ala Phe Thr Ala Phe Glu Glu Ala Leu Ala
65 70 75 80
Ser Ser Gly Val Asn Leu Lys Ala Tyr His Asn Ile Ala Val Cys Leu
85 90 95
Gly Thr Ser Leu Gly Gly Lys Ser Ala Gly Gln Asn Ala Leu Tyr Gln
100 105 110
Phe Glu Glu Gly Glu Arg Gln Val Asp Ala Ser Leu Leu Glu Lys Ala
115 120 125
Ser Val Tyr His Ile Ala Asp Glu Leu Met Ala Tyr His Asp Ile Val
130 135 140
Gly Ala Ser Tyr Val Ile Ser Thr Ala Cys Ser Ala Ser Asn Asn Ala
145 150 155 160
Val Ile Leu Gly Thr Gln Leu Leu Gln Asp Gly Asp Cys Asp Leu Ala
165 170 175
Ile Cys Gly Gly Cys Asp Glu Leu Ser Asp Ile Ser Leu Ala Gly Phe
180 185 190
Thr Ser Leu Gly Ala Ile Asn Thr Glu Met Ala Cys Gln Pro Tyr Ser
195 200 205
Ser Gly Lys Gly Ile Asn Leu Gly Glu Gly Ala Gly Phe Val Val Leu
210 215 220
Val Lys Asp Gln Ser Leu Ala Lys Tyr Gly Lys Ile Ile Gly Gly Leu
225 230 235 240
Ile Thr Ser Asp Gly Tyr His Ile Thr Ala Pro Lys Pro Thr Gly Glu
245 250 255
Gly Ala Ala Gln Ile Ala Lys Gln Leu Val Thr Gln Ala Gly Ile Asp
260 265 270
Tyr Ser Glu Ile Asp Tyr Ile Asn Gly His Gly Thr Gly Thr Gln Ala
275 280 285
Asn Asp Lys Met Glu Lys Asn Met Tyr Gly Lys Phe Phe Pro Thr Thr
290 295 300

```

Thr Leu Ile Ser Ser Thr Lys Gly Gln Thr Gly His Thr Leu Gly Ala
 305 310 315 320
 Ala Gly Ile Ile Glu Leu Ile Asn Cys Leu Ala Ala Ile Glu Glu Gln
 325 330 335
 Thr Val Pro Ala Thr Lys Asn Glu Ile Gly Ile Glu Gly Phe Pro Glu
 340 345 350
 Asn Phe Val Tyr His Gln Lys Arg Glu Tyr Pro Ile Arg Asn Ala Leu
 355 360 365
 Asn Phe Ser Phe Ala Phe Gly Gly Asn Asn Ser Gly Val Leu Leu Ser
 370 375 380
 Ser Leu Asp Ser Pro Leu Glu Thr Leu Pro Ala Arg Glu Asn Leu Lys
 385 390 395 400
 Met Ala Ile Leu Ser Ser Val Ala Ser Ile Ser Lys Asn Glu Ser Leu
 405 410 415
 Ser Ile Thr Tyr Glu Lys Val Ala Ser Asn Phe Asn Asp Phe Glu Ala
 420 425 430
 Leu Arg Phe Lys Gly Ala Arg Pro Pro Lys Thr Val Asn Pro Ala Gln
 435 440 445
 Phe Arg Lys Met Asp Asp Phe Ser Lys Met Val Ala Val Thr Thr Ala
 450 455 460
 Gln Ala Leu Ile Glu Ser Asn Ile Asn Leu Lys Lys Gln Asp Thr Ser
 465 470 475 480
 Lys Val Gly Ile Val Phe Thr Thr Leu Ser Gly Pro Val Glu Val Val
 485 490 495
 Glu Gly Ile Glu Lys Gln Ile Thr Thr Glu Gly Tyr Ala His Val Ser
 500 505 510
 Ala Ser Arg Phe Pro Phe Thr Val Met Asn Ala Ala Ala Gly Met Leu
 515 520 525
 Ser Ile Ile Phe Lys Ile Thr Gly Pro Leu Ser Val Ile Ser Thr Asn
 530 535 540
 Ser Gly Ala Leu Asp Gly Ile Gln Tyr Ala Lys Glu Met Met Arg Asn
 545 550 555 560
 Asp Asn Leu Asp Tyr Val Ile Leu Val Ser Ala Asn Gln Trp Thr Asp
 565 570 575
 Met Ser Phe Met Trp Trp Gln Gln Leu Asn Tyr Asp Ser Gln Met Phe
 580 585 590
 Val Gly Ser Asp Tyr Cys Ser Ala Gln Val Leu Ser Arg Gln Ala Leu
 595 600 605
 Asp Asn Ser Pro Ile Ile Leu Gly Ser Lys Gln Leu Lys Tyr Ser His
 610 615 620
 Lys Thr Phe Thr Asp Val Met Thr Ile Phe Asp Ala Ala Leu Gln Asn
 625 630 635 640
 Leu Leu Ser Asp Leu Gly Leu Thr Ile Lys Asp Ile Lys Gly Phe Val
 645 650 655
 Trp Asn Glu Arg Lys Lys Ala Val Ser Ser Asp Tyr Asp Phe Leu Ala
 660 665 670
 Asn Leu Ser Glu Tyr Tyr Asn Met Pro Asn Leu Ala Ser Gly Gln Phe
 675 680 685
 Gly Phe Ser Ser Asn Gly Ala Gly Glu Glu Leu Asp Tyr Thr Val Asn
 690 695 700
 Glu Ser Ile Glu Lys Gly Tyr Tyr Leu Val Leu Ser Tyr Ser Ile Phe
 705 710 715 720
 Gly Gly Ile Ser Phe Ala Ile Ile Glu Lys Arg

725

730

<210> 46
 <211> 727
 <212> PRT
 <213> Streptococcus agalactiae

<400> 46
 Val Ser Gly Ile Gly Ile Ile Ser Ser Leu Gly Lys Asn Tyr Ser Glu
 1 5 10 15
 His Lys Gln His Leu Phe Asp Leu Lys Glu Gly Ile Ser Lys His Leu
 20 25 30
 Tyr Lys Asn His Asp Ser Ile Leu Glu Ser Tyr Thr Gly Ser Ile Thr
 35 40 45
 Ser Asp Pro Glu Val Pro Glu Gln Tyr Lys Asp Glu Thr Arg Asn Phe
 50 55 60
 Lys Phe Ala Phe Thr Ala Phe Glu Glu Ala Leu Ala Ser Ser Gly Val
 65 70 75 80
 Asn Leu Lys Ala Tyr His Asn Ile Ala Val Cys Leu Gly Thr Ser Leu
 85 90 95
 Gly Gly Lys Ser Ala Gly Gln Asn Ala Leu Tyr Gln Phe Glu Glu Gly
 100 105 110
 Glu Arg Gln Val Asp Ala Ser Leu Leu Glu Lys Ala Ser Val Tyr His
 115 120 125
 Ile Ala Asp Glu Leu Met Ala Tyr His Asp Ile Val Gly Ala Ser Tyr
 130 135 140
 Val Ile Ser Thr Ala Cys Ser Ala Ser Asn Asn Ala Val Ile Leu Gly
 145 150 155 160
 Thr Gln Leu Leu Gln Asp Gly Asp Cys Asp Leu Ala Ile Cys Gly Gly
 165 170 175
 Cys Asp Glu Leu Ser Asp Ile Ser Leu Ala Gly Phe Thr Ser Leu Gly
 180 185 190
 Ala Ile Asn Thr Glu Met Ala Cys Gln Pro Tyr Ser Ser Gly Lys Gly
 195 200 205
 Ile Asn Leu Gly Glu Gly Ala Gly Phe Val Val Leu Val Lys Asp Gln
 210 215 220
 Ser Leu Ala Lys Tyr Gly Lys Ile Ile Gly Gly Leu Ile Thr Ser Asp
 225 230 235 240
 Gly Tyr His Ile Thr Ala Pro Lys Pro Thr Gly Glu Gly Ala Ala Gln
 245 250 255
 Ile Ala Lys Gln Leu Val Thr Gln Ala Gly Ile Asp Tyr Ser Glu Ile
 260 265 270
 Asp Tyr Ile Asn Gly His Gly Thr Gly Thr Gln Ala Asn Asp Lys Met
 275 280 285
 Glu Lys Asn Met Tyr Gly Lys Phe Phe Pro Thr Thr Thr Leu Ile Ser
 290 295 300
 Ser Thr Lys Gly Gln Thr Gly His Thr Leu Gly Ala Ala Gly Ile Ile
 305 310 315 320
 Glu Leu Ile Asn Cys Leu Ala Ala Ile Glu Glu Gln Thr Val Pro Ala
 325 330 335
 Thr Lys Asn Glu Ile Gly Ile Glu Gly Phe Pro Glu Asn Phe Val Tyr
 340 345 350
 His Gln Lys Arg Glu Tyr Pro Ile Arg Asn Ala Leu Asn Phe Ser Phe
 355 360 365
 Ala Phe Gly Gly Asn Asn Ser Gly Val Leu Leu Ser Ser Leu Asp Ser
 370 375 380

Pro Leu Glu Thr Leu Pro Ala Arg Glu Asn Leu Lys Met Ala Ile Leu
 385 390 395 400
 Ser Ser Val Ala Ser Ile Ser Lys Asn Glu Ser Leu Ser Ile Thr Tyr
 405 410 415
 Glu Lys Val Ala Ser Asn Phe Asn Asp Phe Glu Ala Leu Arg Phe Lys
 420 425 430
 Gly Ala Arg Pro Pro Lys Thr Val Asn Pro Ala Gln Phe Arg Lys Met
 435 440 445
 Asp Asp Phe Ser Lys Met Val Ala Val Thr Thr Ala Gln Ala Leu Ile
 450 455 460
 Glu Ser Asn Ile Asn Leu Lys Lys Gln Asp Thr Ser Lys Val Gly Ile
 465 470 475 480
 Val Phe Thr Thr Leu Ser Gly Pro Val Glu Val Val Glu Gly Ile Glu
 485 490 495
 Lys Gln Ile Thr Thr Glu Gly Tyr Ala His Val Ser Ala Ser Arg Phe
 500 505 510
 Pro Phe Thr Val Met Asn Ala Ala Ala Gly Met Leu Ser Ile Ile Phe
 515 520 525
 Lys Ile Thr Thr Gly Pro Leu Ser Val Ile Ser Thr Asn Ser Gly Ala Leu
 530 535 540
 Asp Gly Ile Gln Tyr Ala Lys Glu Met Met Arg Asn Asp Asn Leu Asp
 545 550 555 560
 Tyr Val Ile Leu Val Ser Ala Asn Gln Trp Thr Asp Met Ser Phe Met
 565 570 575
 Trp Trp Gln Gln Leu Asn Tyr Asp Ser Gln Met Phe Val Gly Ser Asp
 580 585 590
 Tyr Cys Ser Ala Gln Val Leu Ser Arg Gln Ala Leu Asp Asn Ser Pro
 595 600 605
 Ile Ile Leu Gly Ser Lys Gln Leu Lys Tyr Ser His Lys Thr Phe Thr
 610 615 620
 Asp Val Met Thr Ile Phe Asp Ala Ala Leu Gln Asn Leu Leu Ser Asp
 625 630 635 640
 Leu Gly Leu Thr Ile Lys Asp Ile Lys Gly Phe Val Trp Asn Glu Arg
 645 650 655
 Lys Lys Ala Val Ser Ser Asp Tyr Asp Phe Leu Ala Asn Leu Ser Glu
 660 665 670
 Tyr Tyr Asn Met Pro Asn Leu Ala Ser Gly Gln Phe Gly Phe Ser Ser
 675 680 685
 Asn Gly Ala Gly Glu Glu Leu Asp Tyr Thr Val Asn Glu Ser Ile Glu
 690 695 700
 Lys Gly Tyr Tyr Leu Val Leu Ser Tyr Ser Ile Phe Gly Gly Ile Ser
 705 710 715 720
 Phe Ala Ile Ile Glu Lys Arg

725

<210> 47
 <211> 900
 <212> DNA
 <213> Streptococcus agalactiae

<400> 47
 atgaaaaatag atgacctaag aaaaagcgac aatgttgaag atcgtcgctc cagtagcgga 60
 ggttcattct ctacgcgagg aagtggatta ccgattcttc aacttttatt gctgcgagg 120
 agttggaaaa ccaagcttgt ggttttaatc atcttactgc tacttgcgcg aggggggacta 180


```

accagcattt ttaatgactc atcctcacct tctagttacc aatctcagaa tgtctcacgt 240
tctgttgata atagcgcaac gagagaacaa atcgatttcg ttaataaagt ccttgggtca 300
actgaggatt tctggtcaca agaattccaa acccaaggtt ttggaatta taaggaacca 360
aaacttgttc ttacaccaa ttcaattcaa acaggttggtg gtataggtag atctgcttca 420
ggaccatttt attgttcagc agataaaaaa atctatcttg atatttcttt ttacaatgaa 480
ttatcacata aatatggtgc tactggtgat ttgctatgg cctacgtcat cgcccacgaa 540
gttggtcacc acattcaaac agagttaggc attatggata agtataatag aatcgacac 600
ggacttacta agaagaagc aaatgcttta aatgttcggc tagaacttca agcagattat 660
tatgcagggg tatgggtcca ctacatcagg ggaaaaaatc tcttagaaca agggactttt 720
gaagaggcca tgaattgtgc ccacgcgctc ggagacgata cccttcagaa agaaacctac 780
ggaaaattag tccttgatag ctttaccat ggaacagctg aacaacgcca acgttggttt 840
aacaaggct ttcaatatgg tgacatccaa cacggtgata ctttctcgt agaactcta 900

```

```

<210> 48
<211> 300
<212> PRT
<213> Streptococcus agalactiae

```

```

<400> 48
Met Lys Ile Asp Asp Leu Arg Lys Ser Asp Asn Val Glu Asp Arg Arg
1 5 10 15
Ser Ser Ser Gly Gly Ser Phe Ser Ser Gly Gly Ser Gly Leu Pro Ile
20 25 30
Leu Gln Leu Leu Leu Leu Arg Gly Ser Trp Lys Thr Lys Leu Val Val
35 40 45
Leu Ile Ile Leu Leu Leu Leu Gly Gly Gly Leu Thr Ser Ile Phe
50 55 60
Asn Asp Ser Ser Ser Pro Ser Ser Tyr Gln Ser Gln Asn Val Ser Arg
65 70 75 80
Ser Val Asp Asn Ser Ala Thr Arg Glu Gln Ile Asp Phe Val Asn Lys
85 90 95
Val Leu Gly Ser Thr Glu Asp Phe Trp Ser Gln Glu Phe Gln Thr Gln
100 105 110
Gly Phe Gly Asn Tyr Lys Glu Pro Lys Leu Val Leu Tyr Thr Asn Ser
115 120 125
Ile Gln Thr Gly Cys Gly Ile Gly Glu Ser Ala Ser Gly Pro Phe Tyr
130 135 140
Cys Ser Ala Asp Lys Lys Ile Tyr Leu Asp Ile Ser Phe Tyr Asn Glu
145 150 155 160
Leu Ser His Lys Tyr Gly Ala Thr Gly Asp Phe Ala Met Ala Tyr Val
165 170 175
Ile Ala His Glu Val Gly His His Ile Gln Thr Glu Leu Gly Ile Met
180 185 190
Asp Lys Tyr Asn Arg Met Arg His Gly Leu Thr Lys Lys Glu Ala Asn
195 200 205
Ala Leu Asn Val Arg Leu Glu Leu Gln Ala Asp Tyr Tyr Ala Gly Val
210 215 220
Trp Ala His Tyr Ile Arg Gly Lys Asn Leu Leu Glu Gln Gly Asp Phe
225 230 235 240
Glu Glu Ala Met Asn Ala Ala His Ala Val Gly Asp Asp Thr Leu Gln
245 250 255
Lys Glu Thr Tyr Gly Lys Leu Val Pro Asp Ser Phe Thr His Gly Thr
260 265 270
Ala Glu Gln Arg Gln Arg Trp Phe Asn Lys Gly Phe Gln Tyr Gly Asp
275 280 285

```

Ile Gln His Gly Asp Thr Phe Ser Val Glu His Leu
 290 295 300

<210> 49
 <211> 1242
 <212> DNA
 <213> Streptococcus agalactiae

<400> 49
 atgagtaaac gacaaaattt aggaattagt aaaaaaggag caattatatac agggctctca 60
 gtggcactaa ttgtagtaat aggtggcttt ttatgggtac aatctcaacc taataagagt 120
 gcagtaaaaa ctaactacaa agtttttaaat gttagagaag gaagtgtttc gtcctcaact 180
 cttttgacag gaaaagctaa ggctaatacaa gaacagtatg tgtattttga tgcctaataaa 240
 ggtaatcgag caactgtcac agttaaagtg ggtgataaaa tcacagctgg tcagcagtta 300
 gtccaatgat atacaacaac tgcacaagca gcctacgaca ctgctaatacg tcaattaaat 360
 aaagtagcgc gtcagattaa taatctaaag acaacaggaa gtcttccagc tatggaatca 420
 agtgatcaat cttcttcac atcacaagga caagggactc aatcgactag tgggtgcgacg 480
 aatcgctcac agcaaaatta tcaaagtcac gctaattgctt catacaacca acaacttcaa 540
 gatttgaatg atgcttatgc agatgcacag gcagaagtaa ataaagcaca aaaagcattg 600
 aatgatactg ttattacaag tgaagtatca gggcagattg ttgaagttaa tagtgatatt 660
 gatccagctt caaaaactag tcaagtactt gtccatgtag caactgaagg taaactccaa 720
 gtacaaggaa cgatgagtga gtatgatttg gctaattgta aaaaagacca ggctgtttaa 780
 ataaaatcta aggtctatcc tgacaaggaa tgggaaggta aaatttcata tatctcaaat 840
 tatccagaag cagaagcaaa caacaatgac tctaataacg gctctagtgc tghtaaattat 900
 aatatataag tagatattac tagccctctc gatgcattaa aacaaggttt taccgatatca 960
 gttgaagttag ttaatggaga taagcacctt attgtcccta caagttctgt gataaacaaa 1020
 gataataaac actttgtttg ggtatacaat gattctaact gtaaaatttc caaagtgtaa 1080
 gtcaaaattg gtaaaagctga tgctaagaca caagaaattt tatcaggtt gaaagcagga 1140
 caaatcgtgg ttactaatcc aagtaaaacc ttcaaggatg ggcaaaaaat tgataatatt 1200
 gaatcaatcg atcttaactc taataagaaa tcagaggtag aa 1242

<210> 50
 <211> 414
 <212> PRT
 <213> Streptococcus agalactiae

<400> 50
 Met Ser Lys Arg Gln Asn Leu Gly Ile Ser Lys Lys Gly Ala Ile Ile
 1 5 10 15
 Ser Gly Leu Ser Val Ala Leu Ile Val Val Ile Gly Gly Phe Leu Trp
 20 25 30
 Val Gln Ser Gln Pro Asn Lys Ser Ala Val Lys Thr Asn Tyr Lys Val
 35 40 45
 Phe Asn Val Arg Glu Gly Ser Val Ser Ser Ser Thr Leu Leu Thr Gly
 50 55 60
 Lys Ala Lys Ala Asn Gln Glu Gln Tyr Val Tyr Phe Asp Ala Asn Lys
 65 70 75 80
 Gly Asn Arg Ala Thr Val Thr Val Lys Val Gly Asp Lys Ile Thr Ala
 85 90 95
 Gly Gln Gln Leu Val Gln Tyr Asp Thr Thr Thr Ala Gln Ala Ala Tyr
 100 105 110
 Asp Thr Ala Asn Arg Gln Leu Asn Lys Val Ala Arg Gln Ile Asn Asn
 115 120 125
 Leu Lys Thr Thr Gly Ser Leu Pro Ala Met Glu Ser Ser Asp Gln Ser
 130 135 140

Ser Ser Ser Ser Gln Gly Gln Gly Thr Gln Ser Thr Ser Gly Ala Thr
 145 150 155 160
 Asn Arg Leu Gln Gln Asn Tyr Gln Ser Gln Ala Asn Ala Ser Tyr Asn
 165 170 175
 Gln Gln Leu Gln Asp Leu Asn Asp Ala Tyr Ala Asp Ala Gln Ala Glu
 180 185 190
 Val Asn Lys Ala Gln Lys Ala Leu Asn Asp Thr Val Ile Thr Ser Asp
 195 200 205
 Val Ser Gly Thr Val Val Glu Val Asn Ser Asp Ile Asp Pro Ala Ser
 210 215 220
 Lys Thr Ser Gln Val Leu Val His Val Ala Thr Glu Gly Lys Leu Gln
 225 230 235 240
 Val Gln Gly Thr Met Ser Glu Tyr Asp Leu Ala Asn Val Lys Lys Asp
 245 250 255
 Gln Ala Val Lys Ile Lys Ser Lys Val Tyr Pro Asp Lys Glu Trp Glu
 260 265 270
 Gly Lys Ile Ser Tyr Ile Ser Asn Tyr Pro Glu Ala Glu Ala Asn Asn
 275 280 285
 Asn Asp Ser Asn Asn Gly Ser Ser Ala Val Asn Tyr Lys Tyr Lys Val
 290 295 300
 Asp Ile Thr Ser Pro Leu Asp Ala Leu Lys Gln Gly Phe Thr Val Ser
 305 310 315 320
 Val Glu Val Val Asn Gly Asp Lys His Leu Ile Val Pro Thr Ser Ser
 325 330 335
 Val Ile Asn Lys Asp Asn Lys His Phe Val Trp Val Tyr Asn Asp Ser
 340 345 350
 Asn Arg Lys Ile Ser Lys Val Glu Val Lys Ile Gly Lys Ala Asp Ala
 355 360 365
 Lys Thr Gln Glu Ile Leu Ser Gly Leu Lys Ala Gly Gln Ile Val Val
 370 375 380
 Thr Asn Pro Ser Lys Thr Phe Lys Asp Gly Gln Lys Ile Asp Asn Ile
 385 390 395 400
 Glu Ser Ile Asp Leu Asn Ser Asn Lys Lys Ser Glu Val Lys
 405 410

<210> 51
 <211> 385
 <212> PRT
 <213> Streptococcus agalactiae

<400> 51
 Phe Leu Trp Val Gln Ser Gln Pro Asn Lys Ser Ala Val Lys Thr Asn
 1 5 10 15
 Tyr Lys Val Phe Asn Val Arg Glu Gly Ser Val Ser Ser Ser Thr Leu
 20 25 30
 Leu Thr Gly Lys Ala Lys Ala Asn Gln Glu Gln Tyr Val Tyr Phe Asp
 35 40 45
 Ala Asn Lys Gly Asn Arg Ala Thr Val Thr Val Lys Val Gly Asp Lys
 50 55 60
 Ile Thr Ala Gly Gln Gln Leu Val Gln Tyr Asp Thr Thr Thr Ala Gln
 65 70 75 80
 Ala Ala Tyr Asp Thr Ala Asn Arg Gln Leu Asn Lys Val Ala Arg Gln
 85 90 95
 Ile Asn Asn Leu Lys Thr Thr Gly Ser Leu Pro Ala Met Glu Ser Ser
 100 105 110

Asp Gln Ser Ser Ser Ser Ser Gln Gly Gln Gly Thr Gln Ser Thr Ser
 115 120 125
 Gly Ala Thr Asn Arg Leu Gln Gln Asn Tyr Gln Ser Gln Ala Asn Ala
 130 135 140
 Ser Tyr Asn Gln Gln Leu Gln Asp Leu Asn Asp Ala Tyr Ala Asp Ala
 145 150 155 160
 Gln Ala Glu Val Asn Lys Ala Gln Lys Ala Leu Asn Asp Thr Val Ile
 165 170 175
 Thr Ser Asp Val Ser Gly Thr Val Val Glu Val Asn Ser Asp Ile Asp
 180 185 190
 Pro Ala Ser Lys Thr Ser Gln Val Leu Val His Val Ala Thr Glu Gly
 195 200 205
 Lys Leu Gln Val Gln Gly Thr Met Ser Glu Tyr Asp Leu Ala Asn Val
 210 215 220
 Lys Lys Asp Gln Ala Val Lys Ile Lys Ser Lys Val Tyr Pro Asp Lys
 225 230 235 240
 Glu Trp Glu Gly Lys Ile Ser Tyr Ile Ser Asn Tyr Pro Glu Ala Glu
 245 250 255
 Ala Asn Asn Asn Asp Ser Asn Asn Gly Ser Ser Ala Val Asn Tyr Lys
 260 265 270
 Tyr Lys Val Asp Ile Thr Ser Pro Leu Asp Ala Leu Lys Gln Gly Phe
 275 280 285
 Thr Val Ser Val Glu Val Val Asn Gly Asp Lys His Leu Ile Val Pro
 290 295 300
 Thr Ser Ser Val Ile Asn Lys Asp Asn Lys His Phe Val Trp Val Tyr
 305 310 315 320
 Asn Asp Ser Asn Arg Lys Ile Ser Lys Val Glu Val Lys Ile Gly Lys
 325 330 335
 Ala Asp Ala Lys Thr Gln Glu Ile Leu Ser Gly Leu Lys Ala Gly Gln
 340 345 350
 Ile Val Val Thr Asn Pro Ser Lys Thr Phe Lys Asp Gly Gln Lys Ile
 355 360 365
 Asp Asn Ile Glu Ser Ile Asp Leu Asn Ser Asn Lys Lys Ser Glu Val
 370 375 380
 Lys
 385

<210> 52
 <211> 930
 <212> DNA
 <213> Streptococcus agalactiae

<400> 52
 atgaaaaaaa ttggaattat tgtcctcaca ctactgacct tcttttttgg atcttgcgga 60
 caacaaacta aacaagaaag cactaaaaca actattttcta aatgcctaa aattgaaggc 120
 ttacacctatt atggaaaaaat tccgtaaaaat cggaaaaaag taattaattt tacatattct 180
 tacactgggt atttattaaa actaggtgtt aatgtttcaa gttacagttt agacttagaa 240
 aaagatagcc ccgttttttg taaacaactg aaagaagcta aaaaattaac tgcgtatgat 300
 acagaagcta ttgccgcaca aaaacctgat ttaatcatgg ttttcgatca agatccaac 360
 atcaatctc tgaaaaaaat tgcaccaact ttagtattata aatatgggtgc acaaaattat 420
 ttagatatga tgccagcctt ggggaaaagta ttccgtaaaag aaaaagaagc taatcagtg 480
 gttagccaat ggaaaaactaa aactctcgct gtcaaaaaag atttacacca tatcttaa 540
 cctaactacta cttttactat tatggatttt tatgataaaa atatctattt atatggta 600
 aattttggac gcgttgagaga actaatctat gattcactag gttatgctgc ccagaaaaa 660
 gtcaaaaaag atgtctttta aaaaagggtg tttaccgttt cgcaagaagc aatcggatg 720

tacgttgag	attatgccct	tgtaatat	aacaaaacga	ctaaaaaagc	agcttcacat	780
cttaaagaaa	gtgatgtctg	gaagaattta	ccagctgtca	aaaaagggca	catcatagaa	840
agtaactacg	acgtgtttta	tttctctgac	cctctatctt	tagaagctca	attaaaaatca	900
ttacaaaagg	ctatcaaaga	aaatacaaat				930

<210> 53
 <211> 310
 <212> PRT
 <213> Streptococcus agalactiae

<400> 53

Met	Lys	Lys	Ile	Gly	Ile	Ile	Val	Leu	Thr	Leu	Leu	Thr	Phe	Phe	Leu
1				5				10					15		
Val	Ser	Cys	Gly	Gln	Gln	Thr	Lys	Gln	Glu	Ser	Thr	Lys	Thr	Thr	Ile
			20					25				30			
Ser	Lys	Met	Pro	Lys	Ile	Glu	Gly	Phe	Thr	Tyr	Tyr	Gly	Lys	Ile	Pro
		35				40						45			
Glu	Asn	Pro	Lys	Lys	Val	Ile	Asn	Phe	Thr	Tyr	Ser	Tyr	Thr	Gly	Tyr
	50					55				60					
Leu	Leu	Lys	Leu	Gly	Val	Asn	Val	Ser	Ser	Tyr	Ser	Leu	Asp	Leu	Glu
65				70						75				80	
Lys	Asp	Ser	Pro	Val	Phe	Gly	Lys	Gln	Leu	Lys	Glu	Ala	Lys	Lys	Leu
				85				90						95	
Thr	Ala	Asp	Asp	Thr	Glu	Ala	Ile	Ala	Ala	Gln	Lys	Pro	Asp	Leu	Ile
			100					105					110		
Met	Val	Phe	Asp	Gln	Asp	Pro	Asn	Ile	Asn	Thr	Leu	Lys	Lys	Ile	Ala
		115				120						125			
Pro	Thr	Leu	Val	Ile	Lys	Tyr	Gly	Ala	Gln	Asn	Tyr	Leu	Asp	Met	Met
	130					135					140				
Pro	Ala	Leu	Gly	Lys	Val	Phe	Gly	Lys	Glu	Lys	Glu	Ala	Asn	Gln	Trp
145				150						155				160	
Val	Ser	Gln	Trp	Lys	Thr	Lys	Thr	Leu	Ala	Val	Lys	Lys	Asp	Leu	His
				165				170						175	
His	Ile	Leu	Lys	Pro	Asn	Thr	Thr	Phe	Thr	Ile	Met	Asp	Phe	Tyr	Asp
		180						185						190	
Lys	Asn	Ile	Tyr	Leu	Tyr	Gly	Asn	Asn	Phe	Gly	Arg	Gly	Gly	Glu	Leu
		195				200						205			
Ile	Tyr	Asp	Ser	Leu	Gly	Tyr	Ala	Ala	Pro	Glu	Lys	Val	Lys	Lys	Asp
	210					215					220				
Val	Phe	Lys	Lys	Gly	Trp	Phe	Thr	Val	Ser	Gln	Glu	Ala	Ile	Gly	Asp
225				230						235				240	
Tyr	Val	Gly	Asp	Tyr	Ala	Leu	Val	Asn	Ile	Asn	Lys	Thr	Thr	Lys	Lys
				245				250						255	
Ala	Ala	Ser	Ser	Leu	Lys	Glu	Ser	Asp	Val	Trp	Lys	Asn	Leu	Pro	Ala
			260					265					270		
Val	Lys	Lys	Gly	His	Ile	Ile	Glu	Ser	Asn	Tyr	Asp	Val	Phe	Tyr	Phe
		275					280					285			
Ser	Asp	Pro	Leu	Ser	Leu	Glu	Ala	Gln	Leu	Lys	Ser	Phe	Thr	Lys	Ala
	290					295					300				
Ile	Lys	Glu	Asn	Thr	Asn										
305					310										

<210> 54
 <211> 272
 <212> PRT

<213> Streptococcus agalactiae

<400> 54

```

Glu Gly Phe Thr Tyr Tyr Gly Lys Ile Pro Glu Asn Pro Lys Lys Val
 1          5          10          15
Ile Asn Phe Thr Tyr Ser Tyr Thr Gly Tyr Leu Leu Lys Leu Gly Val
 20          25          30
Asn Val Ser Ser Tyr Ser Leu Asp Leu Glu Lys Asp Ser Pro Val Phe
 35          40          45
Gly Lys Gln Leu Lys Glu Ala Lys Lys Leu Thr Ala Asp Asp Thr Glu
 50          55          60
Ala Ile Ala Ala Gln Lys Pro Asp Leu Ile Met Val Phe Asp Gln Asp
 65          70          75
Pro Asn Ile Asn Thr Leu Lys Lys Ile Ala Pro Thr Leu Val Ile Lys
 85          90          95
Tyr Gly Ala Gln Asn Tyr Leu Asp Met Met Pro Ala Leu Gly Lys Val
100          105          110
Phe Gly Lys Glu Lys Glu Ala Asn Gln Trp Val Ser Gln Trp Lys Thr
115          120          125
Lys Thr Leu Ala Val Lys Lys Asp Leu His His Ile Leu Lys Pro Asn
130          135          140
Thr Thr Phe Thr Ile Met Asp Phe Tyr Asp Lys Asn Ile Tyr Leu Tyr
145          150          155
Gly Asn Asn Phe Gly Arg Gly Gly Glu Leu Ile Tyr Asp Ser Leu Gly
165          170          175
Tyr Ala Ala Pro Glu Lys Val Lys Lys Asp Val Phe Lys Lys Gly Trp
180          185          190
Phe Thr Val Ser Gln Glu Ala Ile Gly Asp Tyr Val Gly Asp Tyr Ala
195          200          205
Leu Val Asn Ile Asn Lys Thr Thr Lys Lys Ala Ala Ser Ser Leu Lys
210          215          220
Glu Ser Asp Val Trp Lys Asn Leu Pro Ala Val Lys Lys Gly His Ile
225          230          235
Ile Glu Ser Asn Tyr Asp Val Phe Tyr Phe Ser Asp Pro Leu Ser Leu
245          250          255
Glu Ala Gln Leu Lys Ser Phe Thr Lys Ala Ile Lys Glu Asn Thr Asn
260          265          270

```

<210> 55

<211> 302

<212> PRT

<213> Streptococcus agalactiae

<400> 55

```

Met Lys Lys Ile Gly Ile Ile Val Leu Thr Leu Leu Thr Phe Phe Leu
 1          5          10          15
Val Ser Cys Gly Gln Gln Thr Lys Gln Glu Ser Thr Lys Thr Thr Ile
 20          25          30
Ser Lys Met Pro Lys Ile Glu Gly Phe Thr Tyr Tyr Gly Lys Ile Pro
 35          40          45
Glu Asn Pro Lys Lys Val Ile Asn Phe Thr Tyr Ser Tyr Thr Gly Tyr
 50          55          60
Leu Leu Lys Leu Gly Val Asn Val Ser Ser Tyr Ser Leu Asp Leu Glu
 65          70          75
Lys Asp Ser Pro Val Phe Gly Lys Gln Leu Lys Glu Ala Lys Lys Leu

```


145 150 155 160

Gly Asn Asn Phe Gly Arg Gly Gly Glu Leu Ile Tyr Asp Ser Leu Gly
 165 170
 Tyr Ala Ala Pro Glu Lys Val Lys Lys Asp Val Phe Lys Lys Gly Trp
 180 185
 Phe Thr Val Ser Gln Glu Ala Ile Gly Asp Tyr Val Gly Asp Tyr Ala
 195 200
 Leu Val Asn Ile Asn Lys Thr Thr Lys Lys Ala Ala Ser Ser Leu Lys
 210 215 220
 Glu Ser Asp Val Trp Lys Asn Leu Pro Ala Val Lys Lys Gly His Ile
 225 230 235
 Ile Glu Ser Asn Tyr Asp Val Phe Tyr Phe Ser Asp Pro Leu Ser Leu
 245 250 255
 Glu Ala Gln Leu Lys Ser Phe Thr
 260

<210> 57
 <211> 576
 <212> DNA
 <213> Streptococcus agalactiae

<400> 57
 atgaaagtga aaaataagat tttaacgatg gtagcactta ctgtcttaac atgtgctact 60
 tattcatcaa tcggttatgc tgatacaagt gataagaata ctgacacgag tgtcgtgact 120
 acgaccttat ctgaggagaa aagatcagat gaactagacc agtctagtac tggttcttct 180
 tctgaaaaatg aatcgagttc atcaagtga ccaagaaaca atccgtcaac taatccacct 240
 acaacagaac catcgcaacc ctacactagt gaagagaaca agcctgatgg tagaacgaag 300
 acagaaattg gcaataataa ggatatttct agtggaaaca aagtattaat ttcagaagat 360
 agtattaaga atttttagtaa agcaagtagt gatcaagaag aagtggaatcg cgaatgaatca 420
 tcatcttcaa aagcaaatga tgggaaaaaa ggccacagta agcctaaaaa ggaacttctc 480
 aaacaggag atagccactc agatactgta atagcatcta cgggagggat tattctgtta 540
 tcattaagt tttaacataa gaaatgaaa ctttat 576

<210> 58
 <211> 192
 <212> PRT
 <213> Streptococcus agalactiae

<400> 58
 Met Lys Val Lys Asn Lys Ile Leu Thr Met Val Ala Leu Thr Val Leu
 5 10 15
 Thr Cys Ala Thr Tyr Ser Ser Ile Gly Tyr Ala Asp Thr Ser Asp Lys
 20 25 30
 Asn Thr Asp Thr Ser Val Val Thr Thr Thr Leu Ser Glu Glu Lys Arg
 35 40 45
 Ser Asp Glu Leu Asp Gln Ser Ser Thr Gly Ser Ser Ser Glu Asn Glu
 50 55 60
 Ser Ser Ser Ser Ser Glu Pro Glu Thr Asn Pro Ser Thr Asn Pro Pro
 65 70 75 80
 Thr Thr Glu Pro Ser Gln Pro Ser Pro Ser Glu Glu Asn Lys Pro Asp
 85 90 95
 Gly Arg Thr Lys Thr Glu Ile Gly Asn Asn Lys Asp Ile Ser Ser Gly
 100 105 110
 Thr Lys Val Leu Ile Ser Glu Asp Ser Ile Lys Asn Phe Ser Lys Ala


```

          115              120              125
Ser Ser Asp Gln Glu Glu Val Asp Arg Asp Glu Ser Ser Ser Lys
    130              135              140
Ala Asn Asp Gly Lys Lys Gly His Ser Lys Pro Lys Lys Glu Leu Pro
145              150              155              160
Lys Thr Gly Asp Ser His Ser Asp Thr Val Ile Ala Ser Thr Gly Gly
    165              170              175
Ile Ile Leu Leu Ser Leu Ser Phe Tyr Asn Lys Lys Met Lys Leu Tyr
    180              185              190

```

```

<210> 59
<211> 165
<212> PRT
<213> Streptococcus agalactiae

```

```

<400> 59
Asp Thr Ser Asp Lys Asn Thr Asp Thr Ser Val Val Thr Thr Thr Leu
 1      5      10      15
Ser Glu Glu Lys Arg Ser Asp Glu Leu Asp Gln Ser Ser Thr Gly Ser
    20      25      30
Ser Ser Glu Asn Glu Ser Ser Ser Ser Glu Pro Glu Thr Asn Pro
    35      40      45
Ser Thr Asn Pro Pro Thr Thr Glu Pro Ser Gln Pro Ser Pro Ser Glu
 50      55      60
Glu Asn Lys Pro Asp Gly Arg Thr Lys Thr Glu Ile Gly Asn Asn Lys
65      70      75      80
Asp Ile Ser Ser Gly Thr Lys Val Leu Ile Ser Glu Asp Ser Ile Lys
    85      90      95
Asn Phe Ser Lys Ala Ser Ser Asp Gln Glu Glu Val Asp Arg Asp Glu
    100      105      110
Ser Ser Ser Ser Lys Ala Asn Asp Gly Lys Lys Gly His Ser Lys Pro
    115      120      125
Lys Lys Glu Leu Pro Lys Thr Gly Asp Ser His Ser Asp Thr Val Ile
    130      135      140
Ala Ser Thr Gly Gly Ile Ile Leu Leu Ser Leu Ser Phe Tyr Asn Lys
145      150      155      160
Lys Met Lys Leu Tyr
    165

```

```

<210> 60
<211> 140
<212> PRT
<213> Streptococcus agalactiae

```

```

<400> 60
Asp Gln Ser Ser Thr Gly Ser Ser Ser Glu Asn Glu Ser Ser Ser Ser
 1      5      10      15
Ser Glu Pro Glu Thr Asn Pro Ser Thr Asn Pro Pro Thr Thr Glu Pro
    20      25      30
Ser Gln Pro Ser Pro Ser Glu Glu Asn Lys Pro Asp Gly Arg Thr Lys
    35      40      45
Thr Glu Ile Gly Asn Asn Lys Asp Ile Ser Ser Gly Thr Lys Val Leu
 50      55      60
Ile Ser Glu Asp Ser Ile Lys Asn Phe Ser Lys Ala Ser Ser Asp Gln
65      70      75      80

```

Glu Glu Val Asp Arg Asp Glu Ser Ser Ser Ser Lys Ala Asn Asp Gly
 85 90 95
 Lys Lys Gly His Ser Lys Pro Lys Lys Glu Leu Pro Lys Thr Gly Asp
 100 105 110
 Ser His Ser Asp Thr Val Ile Ala Ser Thr Gly Gly Ile Ile Leu Leu
 115 120 125
 Ser Leu Ser Phe Tyr Asn Lys Lys Met Lys Leu Tyr
 130 135 140

<210> 61
 <211> 158
 <212> PRT
 <213> Streptococcus agalactiae

<400> 61
 Met Lys Val Lys Asn Lys Ile Leu Thr Met Val Ala Leu Thr Val Leu
 1 5 10 15
 Thr Cys Ala Thr Tyr Ser Ser Ile Gly Tyr Ala Asp Thr Ser Asp Lys
 20 25 30
 Asn Thr Asp Thr Ser Val Val Thr Thr Thr Leu Ser Glu Glu Lys Arg
 35 40 45
 Ser Asp Glu Leu Asp Gln Ser Ser Thr Gly Ser Ser Glu Asn Glu
 50 55 60
 Ser Ser Ser Ser Ser Glu Pro Glu Thr Asn Pro Ser Thr Asn Pro Pro
 65 70 75 80
 Thr Thr Glu Pro Ser Gln Pro Ser Pro Ser Glu Glu Asn Lys Pro Asp
 85 90 95
 Gly Arg Thr Lys Thr Glu Ile Gly Asn Asn Lys Asp Ile Ser Ser Gly
 100 105 110
 Thr Lys Val Leu Ile Ser Glu Asp Ser Ile Lys Asn Phe Ser Lys Ala
 115 120 125
 Ser Ser Asp Gln Glu Glu Val Asp Arg Asp Glu Ser Ser Ser Lys
 130 135 140
 Ala Asn Asp Gly Lys Lys Gly His Ser Lys Pro Lys Lys Glu
 145 150 155

<210> 62
 <211> 131
 <212> PRT
 <213> Streptococcus agalactiae

<400> 62
 Asp Thr Ser Asp Lys Asn Thr Asp Thr Ser Val Val Thr Thr Thr Leu
 1 5 10 15
 Ser Glu Glu Lys Arg Ser Asp Glu Leu Asp Gln Ser Ser Thr Gly Ser
 20 25 30
 Ser Ser Glu Asn Glu Ser Ser Ser Ser Glu Pro Glu Thr Asn Pro
 35 40 45
 Ser Thr Asn Pro Pro Thr Thr Glu Pro Ser Gln Pro Ser Pro Ser Glu
 50 55 60
 Glu Asn Lys Pro Asp Gly Arg Thr Lys Thr Glu Ile Gly Asn Asn Lys
 65 70 75 80
 Asp Ile Ser Ser Gly Thr Lys Val Leu Ile Ser Glu Asp Ser Ile Lys
 85 90 95
 Asn Phe Ser Lys Ala Ser Ser Asp Gln Glu Glu Val Asp Arg Asp Glu

100 105 110
 Ser Ser Ser Ser Lys Ala Asn Asp Gly Lys Lys Gly His Ser Lys Pro
 115 120 125
 Lys Lys Glu
 130

<210> 63
 <211> 106
 <212> PRT
 <213> Streptococcus agalactiae

<400> 63
 Asp Gln Ser Ser Thr Gly Ser Ser Ser Glu Asn Glu Ser Ser Ser Ser
 1 5 10 15
 Ser Glu Pro Glu Thr Asn Pro Ser Thr Asn Pro Pro Thr Thr Glu Pro
 20 25 30
 Ser Gln Pro Ser Pro Ser Glu Glu Asn Lys Pro Asp Gly Arg Thr Lys
 35 40 45
 Thr Glu Ile Gly Asn Asn Lys Asp Ile Ser Ser Gly Thr Lys Val Leu
 50 55 60
 Ile Ser Glu Asp Ser Ile Lys Asn Phe Ser Lys Ala Ser Ser Asp Gln
 65 70 75 80
 Glu Glu Val Asp Arg Asp Glu Ser Ser Ser Lys Ala Asn Asp Gly
 85 90 95
 Lys Lys Gly His Ser Lys Pro Lys Lys Glu
 100 105

<210> 64
 <211> 924
 <212> DNA
 <213> Streptococcus agalactiae

<400> 64
 atgaaaaagga tacggaaaag ccttatTTTT gttctcggag tagttaccct aatttgctta 60
 tgtgcttgta ctaaacaaaag ccagcaaaaa aatggccttg cagtagtgac tagcttttat 120
 ccagtatatt ccattacaaa agcagtttct ggtgatttga atgatattaa aatgattcga 180
 tcacagtcag gtattcatgg ttttgaaccc tcatcaagtg atgttgctgc catttatgat 240
 gctgactcat ttctttatca ttgcacacac ctagaagctt gggcgagacg ttggaacct 300
 agtttgcac cctctaaagt atctgtaatt gaagcttcaa aaggtatgac ttggatataa 360
 gttcattggt tagaagatgt agaggcagaa aaaggagtag atgagtcaac cttgtatgac 420
 cctcacactt ggaatgacct tgtaaaaagta tctgaggaag cacaactcat cgctacacaa 480
 ttagtctaaa aggatcctaa aaacgctaag gttttatcaa aaaaatgctga tcaatttagt 540
 gacaaggcaa tggctattgc agagaagtat aagccaaaat ttaaagctgc aaagtctaaa 600
 tacttttgta cttcacatag agcatttctca tacttagcta agcgatacgg attgactcag 660
 ttaggatttg caggtgtctc aaccgagcaa gaacctagtg ctaaaaaatt agccgaaatt 720
 caggagtttg tgaaaaacata taaggtttaag actatttttg ttgaagaagg agtctcacct 780
 aaattagctc aagcagtagc ttcagctact cgagttaaaa ttgcaagttt aagtccttta 840
 raagcagttc ccaaaaaacaa taaagattac ttgaaaaatt tggaaactaa tcttaaggta 900
 cttgtcaaat cgttaaatca atag 924

<210> 65
 <211> 307
 <212> PRT
 <213> Streptococcus agalactiae

<220>
 <221> VARIANT
 <222> (1)...(307)
 <223> Xaa = Any Amino Acid

<400> 65
 Met Lys Arg Ile Arg Lys Ser Leu Ile Phe Val Leu Gly Val Val Thr
 1 5 10 15
 Leu Ile Cys Leu Cys Ala Cys Thr Lys Gln Ser Gln Gln Lys Asn Gly
 20 25 30
 Leu Ser Val Val Thr Ser Phe Tyr Pro Val Tyr Ser Ile Thr Lys Ala
 35 40 45
 Val Ser Gly Asp Leu Asn Asp Ile Lys Met Ile Arg Ser Gln Ser Gly
 50 55 60
 Ile His Gly Phe Glu Pro Ser Ser Ser Asp Val Ala Ala Ile Tyr Asp
 65 70 75 80
 Ala Asp Leu Phe Leu Tyr His Ser His Thr Leu Glu Ala Trp Ala Arg
 85 90 95
 Arg Leu Glu Pro Ser Leu His His Ser Lys Val Ser Val Ile Glu Ala
 100 105 110
 Ser Lys Gly Met Thr Leu Asp Lys Val His Gly Leu Glu Asp Val Glu
 115 120 125
 Ala Glu Lys Gly Val Asp Glu Ser Thr Leu Tyr Asp Pro His Thr Trp
 130 135 140
 Asn Asp Pro Val Lys Val Ser Glu Glu Ala Gln Leu Ile Ala Thr Gln
 145 150 155 160
 Leu Ala Lys Lys Asp Pro Lys Asn Ala Lys Val Tyr Gln Lys Asn Ala
 165 170 175
 Asp Gln Phe Ser Asp Lys Ala Met Ala Ile Ala Glu Lys Tyr Lys Pro
 180 185 190
 Lys Phe Lys Ala Ala Lys Ser Lys Tyr Phe Val Thr Ser His Thr Ala
 195 200 205
 Phe Ser Tyr Leu Ala Lys Arg Tyr Gly Leu Thr Gln Leu Gly Ile Ala
 210 215 220
 Gly Val Ser Thr Glu Gln Glu Pro Ser Ala Lys Lys Leu Ala Glu Ile
 225 230 235 240
 Gln Glu Phe Val Lys Thr Tyr Lys Val Lys Thr Ile Phe Val Glu Glu
 245 250 255
 Gly Val Ser Pro Lys Leu Ala Gln Ala Val Ala Ser Ala Thr Arg Val
 260 265 270
 Lys Ile Ala Ser Leu Ser Pro Leu Xaa Ala Val Pro Lys Asn Asn Lys
 275 280 285
 Asp Tyr Leu Glu Asn Leu Glu Thr Asn Leu Lys Val Leu Val Lys Ser
 290 295 300
 Leu Asn Gln
 305

<210> 66
 <211> 1134
 <212> DNA
 <213> Streptococcus agalactiae

<400> 66
 atgcctaaga agaaatcaga taccacagaa aaagaagaag ttgtcttaac ggaatggcaa 60
 aagcgtaacc ttgaattttt aaaaaaacgc aaagaagatg aagaagaaca aaaacgtatt 120

```

aacgaaaaat tacgcttaga taaaagaagt aaattaaaaa ttcttctctc tgaagaacct 180
caaaatacta ctaaaattaa gaagcttcat ttccaaaaga ttccaagacc taagattgaa 240
aagaaacaga aaaaagaaaa aatagtcac acgttagcca aaactaatcg cattagaact 300
gcacctatat ttgtagttagc attcctagtc attttagttt ccggttttctc actaactcct 360
tttagtaagc aaaaaacaat aacagtttagt ggaatcagc atacacactga tgatattttg 420
atagagaaaa cgaattattca aaaaacgat tattctttt cttaattttt taacataaaa 480
gctattgaac aacgcttttagc tgcagaagat gtaggggttaa aaacagctca tagacttat 540
caatttccca ataagtttca tattcaagtt caagaaaata agattattgc atatgcacat 600
acaaagcaag gatatacaacc tgtcttgaa actggaaaaa aggctgatcc tgtaaatagt 660
tcagagctac caaagcactt ctaacaatt aaccttgata aggaagatga tattaagata 720
ttaattaaag atttaaaggc tttagaccct gatttaataa gtgagattca ggtgataagt 780
ttagctgatt ctaaaacgac acctgacctc ctgctgttag atatgcacga tggaaatagt 840
attagaatac cattatctaa atttaaagaa agacttccct ttacaaaaca aattaagaag 900
aaccttaagg aaccttctat tgttgatatg gaagtgggag ttacacaac aacaaatacc 960
attgaatcaa ccctgttaa gcagagaagat acaaaaaata aatcaactga taaacacaa 1020
acacaaaaag gtacaggttc gaagaaatag caaggacaaa caaataacta aaataacta 1080
caacaaggac aacagatagc aacagagcag gcacctaac ctcaaatagt taat 1134

```

```

<210> 67
<211> 378
<212> PRT
<213> Streptococcus agalactiae

```

```

<400> 67
Met Pro Lys Lys Lys Ser Asp Thr Pro Glu Lys Glu Glu Val Val Leu
1 5 10 15
Thr Glu Trp Gln Lys Arg Asn Leu Glu Phe Leu Lys Lys Arg Lys Glu
20 25 30
Asp Glu Glu Glu Gln Lys Arg Ile Asn Glu Lys Leu Arg Leu Asp Lys
35 40 45
Arg Ser Lys Leu Asn Ile Ser Ser Pro Glu Glu Pro Gln Asn Thr Thr
50 55 60
Lys Ile Lys Lys Leu His Phe Pro Lys Ile Ser Arg Pro Lys Ile Glu
65 70 75 80
Lys Lys Gln Lys Lys Glu Lys Ile Val Asn Ser Leu Ala Lys Thr Asn
85 90 95
Arg Ile Arg Thr Ala Pro Ile Phe Val Val Ala Phe Leu Val Ile Leu
100 105 110
Val Ser Val Phe Leu Leu Thr Pro Phe Ser Lys Gln Lys Thr Ile Thr
115 120 125
Val Ser Gly Asn Gln His Thr Pro Asp Asp Ile Leu Ile Glu Lys Thr
130 135 140
Asn Ile Gln Lys Asn Asp Tyr Phe Phe Ser Leu Ile Phe Lys His Lys
145 150 155 160
Ala Ile Glu Gln Arg Leu Ala Ala Glu Asp Val Trp Val Lys Thr Ala
165 170 175
Gln Met Thr Tyr Gln Phe Pro Asn Lys Phe His Ile Gln Val Gln Glu
180 185 190
Asn Lys Ile Ile Ala Tyr Ala His Thr Lys Gln Gly Tyr Gln Pro Val
195 200 205
Leu Glu Thr Gly Lys Lys Ala Asp Pro Val Asn Ser Ser Glu Leu Pro
210 215 220
Lys His Phe Leu Thr Ile Asn Leu Asp Lys Glu Asp Ser Ile Lys Leu
225 230 235 240
Leu Ile Lys Asp Leu Lys Ala Leu Asp Pro Asp Leu Ile Ser Glu Ile

```



```

gggatgaatt tagattctaa aaaattgcta gaattgtcta aaaacatcct catgagctca 1860
gcaacagcat tatatagtga agaggataag gcgttttatt caccacgtca gcaaggtgca 1920
gggtgtagtt atgctgtaaaa agctatccaa gctcaatatt atattactgg aaacgatggc 1980
aaagctcaaaa ttaattctcaa acgaatggga gataaatttg atatcacagt tacaattcat 2040
aaacttgtag aaggtgtgcaa agaatttgtat tatcaagcta atgtagcaac agaacaagta 2100
aataaaaggta aatttgcctt taaccacaaa gccttgcctag atactaattg gcagaaagta 2160
attcttcgtg ataaagaaac acaagttcga tttactattg atgctagtca atttagtcag 2220
aaattaaaaa aacagatggc aaatggttat tttctagaag gttttgtacg ttttaaagaa 2280
gccaaaggata gtaacaggga gttaatgagt attccttttg taggatttaa tgggtatttt 2340
gcgaacttac aagcacttga aacaccgatt tataagacgc tttctaaagg tagtttctac 2400
tataaaccaa atgatacaac tcataaagac caattggagt acaatgaatc agctcctttt 2460
gaaagcaaca actatactgc cttgttaaca caatcagcgt cttggggcta tgttgattat 2520
gtcaaaaatg gtggggagtt agaattagca ccggagagtc caaaaagaat tatttttaga 2580
acttttgaga ataagggtga ggataaaaaca attcattctt tggaaagaga tgcagcgaat 2640
aatccattat ttgccatttc tccaaaataa gatggaaaata gggacgaat cactccccag 2700
gcaactttct taagaaatgt taaggatatt tctgctcaag tcttagatca aaatggaat 2760
gttatttggc aaagtaaggt tttaccatct tatcgtaaaa atttccataa taatccaaag 2820
caaatgtgat gtcattatcg tatggatgct cttcagtggg gtggtttaga taaggatggc 2880
aaagtgttag cagatggttt ttatacttat cgcttacggt acacaccagt agcagaagga 2940
gcaaatagtc aggaagttaga ctttaaagta caagtaagta ctaagtcaac aaatcttctc 3000
tcacagatct agtttgatga aactaatcga acattaagct tagccatgcc taaggaaagt 3060
agttatgttc ctacatatcg tttaacaatta gttttatctc atgtgtgtaa agatgaagaa 3120
tatggggatg agacttctta ccattatttc catatagatc aagaaggtta agtgacactt 3180
cctaaaaacgg ttaagatagg agagagttag gttgcggtag accctaaggc cttgacactt 3240
gtgtgtggaag ataaagctgg taatttcgca acggtaaaaa tgtctgatct cttgaataag 3300
gcagtagtat cagagaaaga aaacgctata gtaattttcta acagtttcaa atatttttag 3360
aacctgaaaa aagaacctat gtttatttct aaaaaagaaa aagtagtaaa caagaatcta 3420
gaagaaataa tattagttaa gccgcaaac acagttacta ctcaatcatt ctgtaaaaga 3480
ataactaat caggaaatga gaaagtcctc acttctacaa acaataatag tagcagagta 3540
gctaagatca tatcacctaa acataacggg gattctgtta accatacctt acctagtaca 3600
tcagatagag caacgaatgg tctatttggg ggtactttgg cattgttatc tagtttactt 3660
ctttatttga aacccaaaaa gactaaaaat aatagtaaaa 3699

```

```

<210> 69
<211> 1233
<212> PRT
<213> Streptococcus agalactiae

```

```

<400> 69
Val Asp Lys His His Ser Lys Lys Ala Ile Leu Lys Leu Thr Leu Ile
1 5 10 15
Thr Thr Ser Ile Leu Leu Met His Ser Asn Gln Val Asn Ala Glu Glu
20 25 30
Gln Glu Leu Lys Asn Gln Glu Gln Ser Pro Val Ile Ala Asn Val Ala
35 40 45
Gln Gln Pro Ser Pro Ser Val Thr Thr Asn Thr Val Glu Lys Thr Ser
50 55 60
Val Thr Ala Ala Ser Ala Ser Asn Thr Ala Lys Glu Met Gly Asp Thr
65 70 75 80
Ser Val Lys Asn Asp Lys Thr Glu Asp Glu Leu Leu Glu Glu Leu Ser
85 90 95
Lys Asn Leu Asp Thr Ser Asn Leu Gly Ala Asp Leu Glu Glu Glu Tyr
100 105 110
Pro Ser Lys Pro Glu Thr Thr Asn Asn Lys Glu Ser Asn Val Val Thr
115 120 125

```

Asn Ala Ser Thr Ala Ile Ala Gln Lys Val Pro Ser Ala Tyr Glu Glu
 130 135 140
 Val Lys Pro Glu Ser Lys Ser Ser Leu Ala Val Leu Asp Thr Ser Lys
 145 150 155 160
 Ile Thr Lys Leu Gln Ala Ile Thr Gln Arg Gly Lys Gly Asn Val Val
 165 170 175
 Ala Ile Ile Asp Thr Gly Phe Asp Ile Asn His Asp Ile Phe Arg Leu
 180 185 190
 Asp Ser Pro Lys Asp Asp Lys His Ser Phe Lys Thr Lys Thr Glu Phe
 195 200 205
 Glu Glu Leu Lys Ala Lys His Asn Ile Thr Tyr Gly Lys Trp Val Asn
 210 215 220
 Asp Lys Ile Val Phe Ala His Asn Tyr Ala Asn Asn Thr Glu Thr Val
 225 230 235 240
 Ala Asp Ile Ala Ala Ala Met Lys Asp Gly Tyr Gly Ser Glu Ala Lys
 245 250 255
 Asn Ile Ser His Gly Thr His Val Ala Gly Ile Phe Val Gly Asn Ser
 260 265 270
 Lys Arg Pro Ala Ile Asn Gly Leu Leu Leu Glu Gly Ala Ala Pro Asn
 275 280 285
 Ala Gln Val Leu Leu Met Arg Ile Pro Asp Lys Ile Asp Ser Asp Lys
 290 295 300
 Phe Gly Glu Ala Tyr Ala Lys Ala Ile Thr Asp Ala Val Asn Leu Gly
 305 310 315 320
 Ala Lys Thr Ile Asn Met Ser Ile Gly Lys Thr Ala Asp Ser Leu Ile
 325 330 335
 Ala Leu Asn Asp Lys Val Lys Leu Ala Leu Lys Leu Ala Ser Glu Lys
 340 345 350
 Gly Val Ala Val Val Val Ala Ala Gly Asn Glu Gly Ala Phe Gly Met
 355 360 365
 Asp Tyr Ser Lys Pro Leu Ser Thr Asn Pro Asp Tyr Gly Thr Val Asn
 370 375 380
 Ser Pro Ala Ile Ser Glu Asp Thr Leu Ser Val Ala Ser Tyr Glu Ser
 385 390 395 400
 Leu Lys Thr Ile Ser Glu Val Val Glu Thr Thr Ile Glu Gly Lys Leu
 405 410 415
 Val Lys Leu Pro Ile Val Thr Ser Lys Pro Phe Asp Lys Gly Lys Ala
 420 425 430
 Tyr Asp Val Val Tyr Ala Asn Tyr Gly Ala Lys Lys Asp Phe Glu Gly
 435 440 445
 Lys Asp Phe Lys Gly Lys Ile Ala Leu Ile Glu Arg Gly Gly Gly Leu
 450 455 460
 Asp Phe Met Thr Lys Ile Thr His Ala Thr Asn Ala Gly Val Val Gly
 465 470 475 480
 Ile Val Ile Phe Asn Asp Gln Glu Lys Arg Gly Asn Phe Leu Ile Pro
 485 490 495
 Tyr Arg Glu Leu Pro Val Gly Ile Ile Ser Lys Val Asp Gly Glu Arg
 500 505 510
 Ile Lys Asn Thr Ser Ser Gln Leu Thr Phe Asn Gln Ser Phe Glu Val
 515 520 525
 Val Asp Ser Gln Gly Gly Asn Arg Met Leu Glu Gln Ser Ser Trp Gly
 530 535 540
 Val Thr Ala Glu Gly Ala Ile Lys Pro Asp Val Thr Ala Ser Gly Phe
 545 550 555 560
 Glu Ile Tyr Ser Ser Thr Tyr Asn Asn Gln Tyr Gln Thr Met Ser Gly

[illegible]

Asn Arg Thr Leu Ser Leu Ala Met Pro Lys Glu Ser Ser Tyr Val Pro
 1010 1015 1020
 Thr Tyr Arg Leu Gln Leu Val Leu Ser His Val Val Lys Asp Glu Glu
 1025 1030 1035 1040
 Tyr Gly Asp Glu Thr Ser Tyr His Tyr Phe His Ile Asp Gln Glu Gly
 1045 1050 1055
 Lys Val Thr Leu Pro Lys Thr Val Lys Ile Gly Glu Ser Glu Val Ala
 1060 1065 1070
 Val Asp Pro Lys Ala Leu Thr Leu Val Val Glu Asp Lys Ala Gly Asn
 1075 1080 1085
 Phe Ala Thr Val Lys Leu Ser Asp Leu Leu Asn Lys Ala Val Val Ser
 1090 1095 1100
 Glu Lys Glu Asn Ala Ile Val Ile Ser Asn Ser Phe Lys Tyr Phe Asp
 1105 1110 1115 1120
 Asn Leu Lys Lys Glu Pro Met Phe Ile Ser Lys Lys Glu Lys Val Val
 1125 1130 1135
 Asn Lys Asn Leu Glu Glu Ile Ile Leu Val Lys Pro Gln Thr Thr Val
 1140 1145 1150
 Thr Thr Gln Ser Leu Ser Lys Glu Ile Thr Lys Ser Gly Asn Glu Lys
 1155 1160 1165
 Val Leu Thr Ser Thr Asn Asn Asn Ser Ser Arg Val Ala Lys Ile Ile
 1170 1175 1180
 Ser Pro Lys His Asn Gly Asp Ser Val Asn His Thr Leu Pro Ser Thr
 1185 1190 1195 1200
 Ser Asp Arg Ala Thr Asn Gly Leu Phe Val Gly Thr Leu Ala Leu Leu
 1205 1210 1215
 Ser Ser Leu Leu Leu Tyr Leu Lys Pro Lys Lys Thr Lys Asn Asn Ser
 1220 1225 1230
 Lys

<210> 70
 <211> 1203
 <212> PRT
 <213> Streptococcus agalactiae

<400> 70
 Glu Glu Gln Glu Leu Lys Asn Gln Glu Gln Ser Pro Val Ile Ala Asn
 1 5 10 15
 Val Ala Gln Gln Pro Ser Pro Ser Val Thr Thr Asn Thr Val Glu Lys
 20 25 30
 Thr Ser Val Thr Ala Ala Ser Ala Ser Asn Thr Ala Lys Glu Met Gly
 35 40 45
 Asp Thr Ser Val Lys Asn Asp Lys Thr Glu Asp Glu Leu Leu Glu Glu
 50 55 60
 Leu Ser Lys Asn Leu Asp Thr Ser Asn Leu Gly Ala Asp Leu Glu Glu
 65 70 75 80
 Glu Tyr Pro Ser Lys Pro Glu Thr Thr Asn Asn Lys Glu Ser Asn Val
 85 90 95
 Val Thr Asn Ala Ser Thr Ala Ile Ala Gln Lys Val Pro Ser Ala Tyr
 100 105 110
 Glu Glu Val Lys Pro Glu Ser Lys Ser Ser Leu Ala Val Leu Asp Thr
 115 120 125
 Ser Lys Ile Thr Lys Leu Gln Ala Ile Thr Gln Arg Gly Lys Gly Asn
 130 135 140

Val	Val	Ala	Ile	Ile	Asp	Thr	Gly	Phe	Asp	Ile	Asn	His	Asp	Ile	Phe	145	150	155	160
Arg	Leu	Asp	Ser	Pro	Lys	Asp	Asp	Lys	His	Ser	Phe	Lys	Thr	Lys	Thr	165	170	175	
Glu	Phe	Glu	Glu	Leu	Lys	Ala	Lys	His	Asn	Ile	Thr	Tyr	Gly	Lys	Trp	180	185	190	
Val	Asn	Asp	Lys	Ile	Val	Phe	Ala	His	Asn	Tyr	Ala	Asn	Asn	Thr	Glu	195	200	205	
Thr	Val	Ala	Asp	Ile	Ala	Ala	Ala	Met	Lys	Asp	Gly	Tyr	Gly	Ser	Glu	210	215	220	
Ala	Lys	Asn	Ile	Ser	His	Gly	Thr	His	Val	Ala	Gly	Ile	Phe	Val	Gly	225	230	235	
Asn	Ser	Lys	Arg	Pro	Ala	Ile	Asn	Gly	Leu	Leu	Glu	Gly	Ala	Ala		245	250	255	
Pro	Asn	Ala	Gln	Val	Leu	Leu	Met	Arg	Ile	Pro	Asp	Lys	Ile	Asp	Ser	260	265	270	
Asp	Lys	Phe	Gly	Glu	Ala	Tyr	Ala	Lys	Ala	Ile	Thr	Asp	Ala	Val	Asn	275	280	285	
Leu	Gly	Ala	Lys	Thr	Ile	Asn	Met	Ser	Ile	Gly	Lys	Thr	Ala	Asp	Ser	290	295	300	
Leu	Ile	Ala	Leu	Asn	Asp	Lys	Val	Lys	Leu	Ala	Leu	Lys	Leu	Ala	Ser	305	310	315	
Glu	Lys	Gly	Val	Ala	Val	Val	Val	Ala	Ala	Gly	Asn	Glu	Gly	Ala	Phe	325	330	335	
Gly	Met	Asp	Tyr	Ser	Lys	Pro	Leu	Ser	Thr	Asn	Pro	Asp	Tyr	Gly	Thr	340	345	350	
Val	Asn	Ser	Pro	Ala	Ile	Ser	Glu	Asp	Thr	Leu	Ser	Val	Ala	Ser	Tyr	355	360	365	
Glu	Ser	Leu	Lys	Thr	Ile	Ser	Glu	Val	Val	Glu	Thr	Thr	Ile	Glu	Gly	370	375	380	
Lys	Leu	Val	Lys	Leu	Pro	Ile	Val	Thr	Ser	Lys	Pro	Phe	Asp	Lys	Gly	385	390	395	
Lys	Ala	Tyr	Asp	Val	Val	Tyr	Ala	Asn	Tyr	Gly	Ala	Lys	Lys	Asp	Phe	405	410	415	
Glu	Gly	Lys	Asp	Phe	Lys	Gly	Lys	Ile	Ala	Leu	Ile	Glu	Arg	Gly	Gly	420	425	430	
Gly	Leu	Asp	Phe	Met	Thr	Lys	Ile	Thr	His	Ala	Thr	Asn	Ala	Gly	Val	435	440	445	
Val	Gly	Ile	Val	Ile	Phe	Asn	Asp	Gln	Glu	Lys	Arg	Gly	Asn	Phe	Leu	450	455	460	
Ile	Pro	Tyr	Arg	Glu	Leu	Pro	Val	Gly	Ile	Ile	Ser	Lys	Val	Asp	Gly	465	470	475	
Glu	Arg	Ile	Lys	Asn	Thr	Ser	Ser	Gln	Leu	Thr	Phe	Asn	Gln	Ser	Phe	485	490	495	
Glu	Val	Val	Asp	Ser	Gln	Gly	Gly	Asn	Arg	Met	Leu	Glu	Gln	Ser	Ser	500	505	510	
Trp	Gly	Val	Thr	Ala	Glu	Gly	Ala	Ile	Lys	Pro	Asp	Val	Thr	Ala	Ser	515	520	525	
Gly	Phe	Glu	Ile	Tyr	Ser	Ser	Thr	Tyr	Asn	Asn	Gln	Tyr	Gln	Thr	Met	530	535	540	
Ser	Gly	Thr	Ser	Met	Ala	Ser	Pro	His	Val	Ala	Gly	Leu	Met	Thr	Met	545	550	555	
Leu	Gln	Ser	His	Leu	Ala	Glu	Lys	Tyr	Lys	Gly	Met	Asn	Leu	Asp	Ser	565	570	575	
Lys	Lys	Leu	Leu	Glu	Leu	Ser	Lys	Asn	Ile	Leu	Met	Ser	Ser	Ala	Thr				

580										585										590									
Ala	Leu	Tyr	Ser	Glu	Glu	Asp	Lys	Lys	Ala	Phe	Tyr	Ser	Pro	Arg	Gln	Gln													
		595					600						605																
Gly	Ala	Gly	Val	Val	Asp	Ala	Glu	Lys	Ala	Ile	Gln	Ala	Gln	Tyr	Tyr														
	610					615																							
Ile	Thr	Gly	Asn	Asp	Gly	Lys	Ala	Lys	Ile	Asn	Leu	Lys	Arg	Met	Gly	640													
625					630					635																			
Asp	Lys	Phe	Asp	Ile	Thr	Val	Thr	Ile	His	Lys	Leu	Val	Glu	Gly	Val														
				645						650				655															
Lys	Glu	Leu	Tyr	Tyr	Gln	Ala	Asn	Val	Ala	Thr	Glu	Gln	Val	Asn	Lys														
			660						665					670															
Gly	Lys	Phe	Ala	Leu	Lys	Pro	Gln	Ala	Leu	Leu	Asp	Thr	Asn	Trp	Gln														
		675						680																					
Lys	Val	Ile	Leu	Arg	Asp	Lys	Glu	Thr	Gln	Val	Arg	Phe	Thr	Ile	Asp														
	690					695					700																		
Ala	Ser	Gln	Phe	Ser	Gln	Lys	Leu	Lys	Glu	Gln	Met	Ala	Asn	Gly	Tyr														
705					710					715																			
Phe	Leu	Glu	Gly	Phe	Val	Arg	Phe	Lys	Glu	Ala	Lys	Asp	Ser	Asn	Gln														
				725					730					735															
Glu	Leu	Met	Ser	Ile	Pro	Phe	Val	Gly	Phe	Asn	Gly	Asp	Phe	Ala	Asn														
			740					745					750																
Leu	Gln	Ala	Leu	Glu	Thr	Pro	Ile	Tyr	Lys	Thr	Leu	Ser	Lys	Gly	Ser														
		755					760					765																	
Phe	Tyr	Tyr	Lys	Pro	Asn	Asp	Thr	Thr	His	Lys	Asp	Gln	Leu	Glu	Tyr														
	770					775					780																		
Asn	Glu	Ser	Ala	Pro	Phe	Glu	Ser	Asn	Asn	Tyr	Thr	Ala	Leu	Leu	Thr														
785					790					795																			
Gln	Ser	Ala	Ser	Trp	Gly	Tyr	Val	Asp	Tyr	Val	Lys	Asn	Gly	Gly	Glu														
				805					810					815															
Leu	Glu	Leu	Ala	Pro	Glu	Ser	Pro	Lys	Arg	Ile	Ile	Leu	Gly	Thr	Phe														
		820						825					830																
Glu	Asn	Lys	Val	Glu	Asp	Lys	Thr	Ile	His	Leu	Leu	Glu	Arg	Asp	Ala														
		835					840					845																	
Ala	Asn	Asn	Pro	Tyr	Phe	Ala	Ile	Ser	Pro	Asn	Lys	Asp	Gly	Asn	Arg														
	850					855					860																		
Asp	Glu	Ile	Thr	Pro	Gln	Ala	Thr	Phe	Leu	Arg	Asn	Val	Lys	Asp	Ile														
865					870					875																			
Ser	Ala	Gln	Val	Leu	Asp	Gln	Asn	Gly	Asn	Val	Ile	Trp	Gln	Ser	Lys														
				885																									

Glu Gly Lys Val Thr Leu Pro Lys Thr Val Lys Ile Gly Glu Ser Glu
 1025 1030 1035 1040
 Val Ala Val Asp Pro Lys Ala Leu Thr Leu Val Val Glu Asp Lys Ala
 1045 1050 1055
 Gly Asn Phe Ala Thr Val Lys Leu Ser Asp Leu Leu Asn Lys Ala Val
 1060 1065 1070
 Val Ser Glu Lys Glu Asn Ala Ile Val Ile Ser Asn Ser Phe Lys Tyr
 1075 1080 1085
 Phe Asp Asn Leu Lys Lys Glu Pro Met Phe Ile Ser Lys Lys Glu Lys
 1090 1095 1100
 Val Val Asn Lys Asn Leu Glu Glu Ile Ile Leu Val Lys Pro Gln Thr
 1105 1110 1115
 Thr Val Thr Thr Gln Ser Leu Ser Lys Glu Ile Thr Lys Ser Gly Asn
 1125 1130 1135
 Glu Lys Val Leu Thr Ser Thr Asn Asn Asn Ser Ser Arg Val Ala Lys
 1140 1145 1150
 Ile Ile Ser Pro Lys His Asn Gly Asp Ser Val Asn His Thr Leu Pro
 1155 1160 1165
 Ser Thr Ser Asp Arg Ala Thr Asn Gly Leu Phe Val Gly Thr Leu Ala
 1170 1175 1180
 Leu Leu Ser Ser Leu Leu Leu Tyr Leu Lys Pro Lys Lys Thr Lys Asn
 1185 1190 1195 1200
 Asn Ser Lys

<210> 71
 <211> 1196
 <212> PRT
 <213> Streptococcus agalactiae

<400> 71
 Val Asp Lys His His Ser Lys Lys Ala Ile Leu Lys Leu Thr Leu Ile
 1 5 10 15
 Thr Thr Ser Ile Leu Leu Met His Ser Asn Gln Val Asn Ala Glu Glu
 20 25 30
 Gln Glu Leu Lys Asn Gln Glu Gln Ser Pro Val Ile Ala Asn Val Ala
 35 40 45
 Gln Gln Pro Ser Pro Ser Val Thr Thr Asn Thr Val Glu Lys Thr Ser
 50 55 60
 Val Thr Ala Ala Ser Ala Ser Asn Thr Ala Lys Glu Met Gly Asp Thr
 65 70 75 80
 Ser Val Lys Asn Asp Lys Thr Glu Asp Glu Leu Leu Glu Glu Leu Ser
 85 90 95
 Lys Asn Leu Asp Thr Ser Asn Leu Gly Ala Asp Leu Glu Glu Glu Tyr
 100 105 110
 Pro Ser Lys Pro Glu Thr Thr Asn Asn Lys Glu Ser Asn Val Val Thr
 115 120 125
 Asn Ala Ser Thr Ala Ile Ala Gln Lys Val Pro Ser Ala Tyr Glu Glu
 130 135 140
 Val Lys Pro Glu Ser Lys Ser Ser Leu Ala Val Leu Asp Thr Ser Lys
 145 150 155 160
 Ile Thr Lys Leu Gln Ala Ile Thr Gln Arg Gly Lys Gly Asn Val Val
 165 170 175
 Ala Ile Ile Asp Thr Gly Phe Asp Ile Asn His Asp Ile Phe Arg Leu
 180 185 190

Asp Ser Pro Lys Asp Asp Lys His Ser Phe Lys Thr Lys Thr Glu Phe
 195 200 205
 Glu Glu Leu Lys Ala Lys His Asn Ile Thr Tyr Gly Lys Trp Val Asn
 210 215 220
 Asp Lys Ile Val Phe Ala His Asn Tyr Ala Asn Asn Thr Glu Thr Val
 225 230 235 240
 Ala Asp Ile Ala Ala Ala Met Lys Asp Gly Tyr Gly Ser Glu Ala Lys
 245 250 255
 Asn Ile Ser His Gly Thr His Val Ala Gly Ile Phe Val Gly Asn Ser
 260 265 270
 Lys Arg Pro Ala Ile Asn Gly Leu Leu Glu Gly Ala Ala Pro Asn
 275 280 285
 Ala Gln Val Leu Leu Met Arg Ile Pro Asp Lys Ile Asp Ser Asp Lys
 290 295 300
 Phe Gly Glu Ala Tyr Ala Lys Ala Ile Thr Asp Ala Val Asn Leu Gly
 305 310 315 320
 Ala Lys Thr Ile Asn Met Ser Ile Gly Lys Thr Ala Asp Ser Leu Ile
 325 330 335
 Ala Leu Asn Asp Lys Val Lys Leu Ala Leu Lys Leu Ala Ser Glu Lys
 340 345 350
 Gly Val Ala Val Val Val Ala Ala Gly Asn Glu Gly Ala Phe Gly Met
 355 360 365
 Asp Tyr Ser Lys Pro Leu Ser Thr Asn Pro Asp Tyr Gly Thr Val Asn
 370 375 380
 Ser Pro Ala Ile Ser Glu Asp Thr Leu Ser Val Ala Ser Tyr Glu Ser
 385 390 395 400
 Leu Lys Thr Ile Ser Glu Val Val Glu Thr Thr Ile Glu Gly Lys Leu
 405 410 415
 Val Lys Leu Pro Ile Val Thr Ser Lys Pro Phe Asp Lys Gly Lys Ala
 420 425 430
 Tyr Asp Val Val Tyr Ala Asn Tyr Gly Ala Lys Lys Asp Phe Glu Gly
 435 440 445
 Lys Asp Phe Lys Gly Lys Ile Ala Leu Ile Glu Arg Gly Gly Gly Leu
 450 455 460
 Asp Phe Met Thr Lys Ile Thr His Ala Thr Asn Ala Gly Val Val Gly
 465 470 475 480
 Ile Val Ile Phe Asn Asp Gln Glu Lys Arg Gly Asn Phe Leu Ile Pro
 485 490 495
 Tyr Arg Glu Leu Pro Val Gly Ile Ile Ser Lys Val Asp Gly Glu Arg
 500 505 510
 Ile Lys Asn Thr Ser Ser Gln Leu Thr Phe Asn Gln Ser Phe Glu Val
 515 520 525
 Val Asp Ser Gln Gly Gly Asn Arg Met Leu Glu Gln Ser Ser Trp Gly
 530 535 540
 Val Thr Ala Glu Gly Ala Ile Lys Pro Asp Val Thr Ala Ser Gly Phe
 545 550 555 560
 Glu Ile Tyr Ser Ser Thr Tyr Asn Asn Gln Tyr Gln Thr Met Ser Gly
 565 570 575
 Thr Ser Met Ala Ser Pro His Val Ala Gly Leu Met Thr Met Leu Gln
 580 585 590
 Ser His Leu Ala Glu Lys Tyr Lys Gly Met Asn Leu Asp Ser Lys Lys
 595 600 605
 Leu Leu Glu Leu Ser Lys Asn Ile Leu Met Ser Ser Ala Thr Ala Leu
 610 615 620
 Tyr Ser Glu Glu Asp Lys Ala Phe Tyr Ser Pro Arg Gln Gln Gly Ala

625				630				635				640
Gly	Val	Val	Asp	Ala	Glu	Lys	Ala	Ile	Gln	Ala	Gln	Tyr
				645					650			655
Gly	Asn	Asp	Gly	Lys	Ala	Lys	Ile	Asn	Leu	Lys	Arg	Met
			660					665				670
Phe	Asp	Ile	Thr	Val	Thr	Ile	His	Lys	Leu	Val	Glu	Gly
			675				680					685
Leu	Tyr	Tyr	Gln	Ala	Asn	Val	Ala	Thr	Glu	Gln	Val	Asn
	690					695				700		Lys
Phe	Ala	Leu	Lys	Pro	Gln	Ala	Leu	Leu	Asp	Thr	Asn	Trp
	705				710					715		Gln
Ile	Leu	Arg	Asp	Lys	Glu	Thr	Gln	Val	Arg	Phe	Thr	Ile
			725						730			735
Gln	Phe	Ser	Gln	Lys	Leu	Lys	Glu	Gln	Met	Ala	Asn	Gly
			740					745				750
Glu	Gly	Phe	Val	Arg	Phe	Lys	Glu	Ala	Lys	Asp	Ser	Asn
		755				760						765
Met	Ser	Ile	Pro	Phe	Val	Gly	Phe	Asn	Gly	Asp	Phe	Ala
	770					775				780		Asn
Ala	Leu	Glu	Thr	Pro	Ile	Tyr	Lys	Thr	Leu	Ser	Lys	Gly
	785				790					795		Ser
Tyr	Lys	Pro	Asn	Asp	Thr	Thr	His	Lys	Asp	Gln	Leu	Glu
			805						810			Tyr
Ser	Ala	Pro	Phe	Glu	Ser	Asn	Asn	Tyr	Thr	Ala	Leu	Leu
		820						825				830
Ala	Ser	Trp	Gly	Tyr	Val	Asp	Tyr	Val	Lys	Asn	Gly	Gly
		835					840					845
Leu	Ala	Pro	Glu	Ser	Pro	Lys	Arg	Ile	Ile	Leu	Gly	Thr
	850					855				860		Phe
Lys	Val	Glu	Asp	Lys	Thr	Ile	His	Leu	Leu	Glu	Arg	Asp
	865				870				875			880
Asn	Pro	Tyr	Phe	Ala	Ile	Ser	Pro	Asn	Lys	Asp	Gly	Asn
			885					890				895
Ile	Thr	Pro	Gln	Ala	Thr	Phe	Leu	Arg	Asn	Val	Lys	Asp
		900						905				910
Gln	Val	Leu	Asp	Gln	Asn	Gly	Asn	Val	Ile	Trp	Gln	Ser
		915				920						925
Pro	Ser	Tyr	Arg	Lys	Asn	Phe	His	Asn	Asn	Pro	Lys	Gln
	930					935				940		Ser
His	Tyr	Arg	Met	Asp	Ala	Leu	Gln	Trp	Ser	Gly	Leu	Asp
	945				950				955			Lys
Lys	Val	Val	Ala	Asp	Gly	Phe	Tyr	Thr	Tyr	Arg	Leu	Arg
			965					970				975
Val	Ala	Glu	Gly	Ala	Asn	Ser	Gln	Glu	Ser	Asp	Phe	Lys
		980						985				990
Ser	Thr	Lys	Ser	Pro	Asn	Leu	Pro	Ser	Arg	Ala	Gln	Phe
	995						1000					1005
Asn	Arg	Thr	Leu	Ser	Leu	Ala	Met	Pro	Lys	Glu	Ser	Ser
	1010					1015				1020		Tyr
Thr	Tyr	Arg	Leu	Gln	Leu	Val	Leu	Ser	His	Val	Val	Lys
	1025				1030				1035			1040
Tyr	Gly	Asp	Glu	Thr	Ser	Tyr	His	Tyr	Phe	His	Ile	Asp
		1045						1050				Gln
Lys	Val	Thr	Leu	Pro	Lys	Thr	Val	Lys	Ile	Gly	Glu	Ser
		1060					1065				Glu	Val
											1070	

Val Asp Pro Lys Ala Leu Thr Leu Val Val Glu Asp Lys Ala Gly Asn
 1075 1080 1085
 Phe Ala Thr Val Lys Leu Ser Asp Leu Leu Asn Lys Ala Val Val Ser
 1090 1095 1100
 Glu Lys Glu Asn Ala Ile Val Ile Ser Asn Ser Phe Lys Tyr Phe Asp
 1105 1110 1115 1120
 Asn Leu Lys Lys Glu Pro Met Phe Ile Ser Lys Lys Glu Lys Val Val
 1125 1130 1135
 Asn Lys Asn Leu Glu Glu Ile Ile Leu Val Lys Pro Gln Thr Thr Val
 1140 1145 1150

 Thr Thr Gln Ser Leu Ser Lys Glu Ile Thr Lys Ser Gly Asn Glu Lys
 1155 1160 1165
 Val Leu Thr Ser Thr Asn Asn Asn Ser Ser Arg Val Ala Lys Ile Ile
 1170 1175 1180
 Ser Pro Lys His Asn Gly Asp Ser Val Asn His Thr
 1185 1190 1195

<210> 72
 <211> 1166
 <212> PRT
 <213> Streptococcus agalactiae

<400> 72
 Glu Glu Gln Glu Leu Lys Asn Gln Glu Gln Ser Pro Val Ile Ala Asn
 1 5 10 15
 Val Ala Gln Gln Pro Ser Pro Ser Val Thr Thr Asn Thr Val Glu Lys
 20 25 30
 Thr Ser Val Thr Ala Ala Ser Ala Ser Asn Thr Ala Lys Glu Met Gly
 35 40 45
 Asp Thr Ser Val Lys Asn Asp Lys Thr Glu Asp Glu Leu Leu Glu Glu
 50 55 60
 Leu Ser Lys Asn Leu Asp Thr Ser Asn Leu Gly Ala Asp Leu Glu Glu
 65 70 75 80
 Glu Tyr Pro Ser Lys Pro Glu Thr Thr Asn Asn Lys Glu Ser Asn Val
 85 90 95
 Val Thr Asn Ala Ser Thr Ala Ile Ala Gln Lys Val Pro Ser Ala Tyr
 100 105 110
 Glu Glu Val Lys Pro Glu Ser Lys Ser Ser Leu Ala Val Leu Asp Thr
 115 120 125
 Ser Lys Ile Thr Lys Leu Gln Ala Ile Thr Gln Arg Gly Lys Gly Asn
 130 135 140
 Val Val Ala Ile Ile Asp Thr Gly Phe Asp Ile Asn His Asp Ile Phe
 145 150 155 160
 Arg Leu Asp Ser Pro Lys Asp Asp Lys His Ser Phe Lys Thr Lys Thr
 165 170 175
 Glu Phe Glu Glu Leu Lys Ala Lys His Asn Ile Thr Tyr Gly Lys Trp
 180 185 190
 Val Asn Asp Lys Ile Val Phe Ala His Asn Tyr Ala Asn Asn Thr Glu
 195 200 205
 Thr Val Ala Asp Ile Ala Ala Met Lys Asp Gly Tyr Gly Ser Glu
 210 215 220
 Ala Lys Asn Ile Ser His Gly Thr His Val Ala Gly Ile Phe Val Gly
 225 230 235 240
 Asn Ser Lys Arg Pro Ala Ile Asn Gly Leu Leu Glu Gly Ala Ala

[illegible]

Lys Val Ile Leu Arg Asp Lys Glu Thr Gln Val Arg Phe Thr Ile Asp
 690 695 700
 Ala Ser Gln Phe Ser Gln Lys Leu Lys Glu Gln Met Ala Asn Gly Tyr
 705 710 715 720
 Phe Leu Glu Gly Phe Val Arg Phe Lys Glu Ala Lys Asp Ser Asn Gln
 725 730 735
 Glu Leu Met Ser Ile Pro Phe Val Gly Phe Asn Gly Asp Phe Ala Asn
 740 745 750
 Leu Gln Ala Leu Glu Thr Pro Ile Tyr Lys Thr Leu Ser Lys Gly Ser
 755 760 765
 Phe Tyr Tyr Lys Pro Asn Asp Thr Thr His Lys Asp Gln Leu Glu Tyr
 770 775 780
 Asn Glu Ser Ala Pro Phe Glu Ser Asn Asn Tyr Thr Ala Leu Leu Thr
 785 790 795 800
 Gln Ser Ala Ser Trp Gly Tyr Val Asp Tyr Val Lys Asn Gly Gly Glu
 805 810 815
 Leu Glu Leu Ala Pro Glu Ser Pro Lys Arg Ile Ile Leu Gly Thr Phe
 820 825 830
 Glu Asn Lys Val Glu Asp Lys Thr Ile His Leu Leu Glu Arg Asp Ala
 835 840 845
 Ala Asn Asn Pro Tyr Phe Ala Ile Ser Pro Asn Lys Asp Gly Asn Arg
 850 855 860
 Asp Glu Ile Thr Pro Gln Ala Thr Phe Leu Arg Asn Val Lys Asp Ile
 865 870 875 880
 Ser Ala Gln Val Leu Asp Gln Asn Gly Asn Val Ile Trp Gln Ser Lys
 885 890 895
 Val Leu Pro Ser Tyr Arg Lys Asn Phe His Asn Asn Pro Lys Gln Ser
 900 905 910
 Asp Gly His Tyr Arg Met Asp Ala Leu Gln Trp Ser Gly Leu Asp Lys
 915 920 925
 Asp Gly Lys Val Val Ala Asp Gly Phe Tyr Thr Tyr Arg Leu Arg Tyr
 930 935 940
 Thr Pro Val Ala Glu Gly Ala Asn Ser Gln Glu Ser Asp Phe Lys Val
 945 950 955 960
 Gln Val Ser Thr Lys Ser Pro Asn Leu Pro Ser Arg Ala Gln Phe Asp
 965 970 975
 Glu Thr Asn Arg Thr Leu Ser Leu Ala Met Pro Lys Glu Ser Ser Tyr
 980 985 990
 Val Pro Thr Tyr Arg Leu Gln Leu Val Leu Ser His Val Val Lys Asp
 995 1000 1005
 Glu Glu Tyr Gly Asp Glu Thr Ser Tyr His Tyr Phe His Ile Asp Gln
 1010 1015 1020
 Glu Gly Lys Val Thr Leu Pro Lys Thr Val Lys Ile Gly Glu Ser Glu
 1025 1030 1035 1040
 Val Ala Val Asp Pro Lys Ala Leu Thr Leu Val Val Glu Asp Lys Ala
 1045 1050 1055
 Gly Asn Phe Ala Thr Val Lys Leu Ser Asp Leu Leu Asn Lys Ala Val
 1060 1065 1070
 Val Ser Glu Lys Glu Asn Ala Ile Val Ile Ser Asn Ser Phe Lys Tyr
 1075 1080 1085
 Phe Asp Asn Leu Lys Lys Glu Pro Met Phe Ile Ser Lys Lys Glu Lys
 1090 1095 1100
 Val Val Asn Lys Asn Leu Glu Glu Ile Ile Leu Val Lys Pro Gln Thr
 1105 1110 1115 1120

Thr Val Thr Thr Gln Ser Leu Ser Lys Glu Ile Thr Lys Ser Gly Asn
1125 1130 1135
Glu Lys Val Leu Thr Ser Thr Asn Asn Asn Ser Ser Arg Val Ala Lys
1140 1145 1160
Ile Ile Ser Pro Lys His Asn Gly Asp Ser Val Asn His Thr
1155 1160 1165

<210> 73
<211> 2040
<212> DNA
<213> Streptococcus agalactiae

<400> 73
atgaaacgta aatactttat tcttaatacgt gtgacggttt taacgttagc tgcgtcaatg 60
aatactagca gtatctatgc taatagtact gagacaagtg cttcagtagt tctactacac 120
aatactatcg ttcaaaactaa tgacagtaat cctaccgcaa aatttgtatc agaatacagga 180
caatctgtaa taggtcaagt aaaaccagat aattctgcgg cgcttacaac agtggaacacg 240
cctcatcata ttctagctcc agatgcttta aaaaacaactc aatcaagtcc tgcgtgttag 300
agtaacttcta ctaagttaac tgaagagact tacaacaacaa aagatgggtca agatttagcc 360
aacatgggtga gaagtggtca agttactagt gaggaactcg ttaatatggc atacgatatt 420
attgctaaag aaaacccatc tttaaatgca gtcattacta ctgacgcca agaagctatt 480
gaagagggtga gaaaacttaa agataccaat cagccgcttt taggtgttcc ctgttagtgc 540
aaggggttag ggcacagtat taaaggtggt gaaaccaata atggcttgat ctatgcagat 600
ggaaaaatta gcacatttga cagttagctat gtcaaaaaat ataaagattt aggtatttatt 660
attttaggac aaacgaactt tccagagtat ggggtggcga atataacaga ttctaaaatta 720
tacgggtctaa cgcataatcc ttgggatctt gctcataatg ctggtggctc ttctgggtgga 780
agtgacagag ccattgctag cgaatgacg ccaattgcta gcggttagtga tgcgtgtggt 840
tctatccgta ttccatcttc ttggacgggc ttggtaggtt taaaaccaac aagaggattg 900
gtgagtaatg aaaagccaga ttctgtatag acagcagttc attttccatt aactaagtca 960
tctagagacg cagaaacatt attaacttat ctaaaagaaa gcgatcaaac gctagtatca 1020
gttaatgatt taaaatcttt accaattgct tatactttga aatcaccaat gggaacagaa 1080
gttagtcaag atgctaaaaa cgctattatg gacaacgtca cattcttaag aaaaacagga 1140
ttcaagtaaa cagagataga cttaccaatt gatggtagag cattaatgcg tgattattca 1200
accttggtcta ttggcatggg aggagctttt tcaacaattg aaaaagacct aaaaacaact 1260
ggttttacta aagaagacgt tgatcctatt acttgggcag ttcatgttat ttatcaaat 1320
tcagataagg ctgaacttaa gaaatctatt atgggaagccc aaaaacatat ggtatgattt 1380
cgtaaggcaa tggagaagct tcacaagcaa ttctctattt tcttatcgcc aacgaccgca 1440
agtttagccc ctctaaatag atgacctatg gtaacagagg aagataaaaag agcgatttat 1500
aatatggaaa acttgagcca agaagaaaga attgctctct ttaatcgcca gtggggacct 1560
atgttgcgta gaacaccttt tacacaaatt gctaatatga caggactccc agctatcagt 1620
atcccgactt acttatctga gtctgggtta cccataggga cgtgttaat ggcaggtgca 1680
aactatgata tggatttaatt taaatttgca actttctttg aaaaacatca tggtttttaat 1740
gttaaatggc aaagaataat agataaagaa gtgaaacat ctactggcct atacagacct 1800
actaaactccc tctttaaagc tcatctatca ttagtaaat tagaagaaaa ttcacaagtt 1860
actcaagtat ctatctctaa aaaatggatg aaatcgctcg ttaaaaataa accatccgta 1920
atggcatatc aaaaagcact tccataaaca ggtgatcac aatcaagcct atctccagtt 1980
ttagtagtaa cctttttatt agcttgtttt agctttgtaa caaaaagaa tcagaaaagt 2040

<210> 74
<211> 680
<212> PRT
<213> Streptococcus agalactiae

<400> 74
Met Lys Arg Lys Tyr Phe Ile Leu Asn Thr Val Thr Val Leu Thr Leu

1	5	10	15
Ala Ala Ala Met Asn Thr Ser Ser Ile Tyr Ala Asn Ser Thr Glu Thr			
	20	25	30
Ser Ala Ser Val Val Pro Thr Thr Asn Thr Ile Val Gln Thr Asn Asp			
	35	40	45
Ser Asn Pro Thr Ala Lys Phe Val Ser Glu Ser Gly Gln Ser Val Ile			
	50	55	60
Gly Gln Val Lys Pro Asp Asn Ser Ala Ala Leu Thr Thr Val Asp Thr			
65	70	75	80
Pro His His Ile Ser Ala Pro Asp Ala Leu Lys Thr Thr Gln Ser Ser			
	85	90	95
Pro Val Val Glu Ser Thr Ser Thr Lys Leu Thr Glu Glu Thr Tyr Lys			
	100	105	110
Gln Lys Asp Gly Gln Asp Leu Ala Asn Met Val Arg Ser Gly Gln Val			
	115	120	125
Thr Ser Glu Glu Leu Val Asn Met Ala Tyr Asp Ile Ile Ala Lys Glu			
	130	135	140
Asn Pro Ser Leu Asn Ala Val Ile Thr Thr Arg Arg Gln Glu Ala Ile			
145	150	155	160
Glu Glu Ala Arg Lys Leu Lys Asp Thr Asn Gln Pro Phe Leu Gly Val			
	165	170	175
Pro Leu Leu Val Lys Gly Leu Gly His Ser Ile Lys Gly Gly Glu Thr			
	180	185	190
Asn Asn Gly Leu Ile Tyr Ala Asp Gly Lys Ile Ser Thr Phe Asp Ser			
	195	200	205
Ser Tyr Val Lys Lys Tyr Lys Asp Leu Gly Phe Ile Ile Leu Gly Gln			
	210	215	220
Thr Asn Phe Pro Glu Tyr Gly Trp Arg Asn Ile Thr Asp Ser Lys Leu			
225	230	235	240
Tyr Gly Leu Thr His Asn Pro Trp Asp Leu Ala His Asn Ala Gly Gly			
	245	250	255
Ser Ser Gly Gly Ser Ala Ala Ala Ile Ala Ser Gly Met Thr Pro Ile			
	260	265	270
Ala Ser Gly Ser Asp Ala Gly Gly Ser Ile Arg Ile Pro Ser Ser Trp			
	275	280	285
Thr Gly Leu Val Gly Leu Lys Pro Thr Arg Gly Leu Val Ser Asn Glu			
	290	295	300
Lys Pro Asp Ser Tyr Ser Thr Ala Val His Phe Pro Leu Thr Lys Ser			
305	310	315	320
Ser Arg Asp Ala Glu Thr Leu Leu Thr Tyr Leu Lys Lys Ser Asp Gln			
	325	330	335
Thr Leu Val Ser Val Asn Asp Leu Lys Ser Leu Pro Ile Ala Tyr Thr			
	340	345	350
Leu Lys Ser Pro Met Gly Thr Glu Val Ser Gln Asp Ala Lys Asn Ala			
	355	360	365
Ile Met Asp Asn Val Thr Phe Leu Arg Lys Gln Gly Phe Lys Val Thr			
	370	375	380
Glu Ile Asp Leu Pro Ile Asp Gly Arg Ala Leu Met Arg Asp Tyr Ser			
385	390	395	400
Thr Leu Ala Ile Gly Met Gly Gly Ala Phe Ser Thr Ile Glu Lys Asp			
	405	410	415
Leu Lys Lys His Gly Phe Thr Lys Glu Asp Val Asp Pro Ile Thr Trp			
	420	425	430
Ala Val His Val Ile Tyr Gln Asn Ser Asp Lys Ala Glu Leu Lys Lys			
	435	440	445

Ser Ile Met Glu Ala Gln Lys His Met Asp Asp Tyr Arg Lys Ala Met
 450 455 460
 Glu Lys Leu His Lys Gln Phe Pro Ile Phe Leu Ser Pro Thr Thr Ala
 465 470 475 480
 Ser Leu Ala Pro Leu Asn Thr Asp Pro Tyr Val Thr Glu Glu Asp Lys
 485 490 495
 Arg Ala Ile Tyr Asn Met Glu Asn Leu Ser Gln Glu Glu Arg Ile Ala
 500 505 510
 Leu Phe Asn Arg Gln Trp Glu Pro Met Leu Arg Arg Thr Pro Phe Thr
 515 520 525
 Gln Ile Ala Asn Met Thr Gly Leu Pro Ala Ile Ser Ile Pro Thr Tyr
 530 535 540
 Leu Ser Glu Ser Gly Leu Pro Ile Gly Thr Met Leu Met Ala Gly Ala
 545 550 555 560
 Asn Tyr Asp Met Val Leu Ile Lys Phe Ala Thr Phe Phe Glu Lys His
 565 570 575
 His Gly Phe Asn Val Lys Trp Gln Arg Ile Ile Asp Lys Glu Val Lys
 580 585 590
 Pro Ser Thr Gly Leu Ile Gln Pro Thr Asn Ser Leu Phe Lys Ala His
 595 600 605
 Ser Ser Leu Val Asn Leu Glu Glu Asn Ser Gln Val Thr Gln Val Ser
 610 615 620
 Ile Ser Lys Lys Trp Met Lys Ser Ser Val Lys Asn Lys Pro Ser Val
 625 630 635 640
 Met Ala Tyr Gln Lys Ala Leu Pro Lys Thr Gly Asp Thr Glu Ser Ser
 645 650 655
 Leu Ser Pro Val Leu Val Val Thr Leu Leu Leu Ala Cys Phe Ser Phe
 660 665 670
 Val Thr Lys Lys Asn Gln Lys Ser
 675 680

<210> 75

<211> 642

<212> PRT

<213> Streptococcus agalactiae

<400> 75

Thr Thr Asn Thr Ile Val Gln Thr Asn Asp Ser Asn Pro Thr Ala Lys
 1 5 10 15
 Phe Val Ser Glu Ser Gly Gln Ser Val Ile Gly Gln Val Lys Pro Asp
 20 25 30
 Asn Ser Ala Ala Leu Thr Thr Val Asp Thr Pro His His Ile Ser Ala
 35 40 45
 Pro Asp Ala Leu Lys Thr Thr Gln Ser Ser Pro Val Val Glu Ser Thr
 50 55 60
 Ser Thr Lys Leu Thr Glu Glu Thr Tyr Lys Gln Lys Asp Gly Gln Asp
 65 70 75 80
 Leu Ala Asn Met Val Arg Ser Gly Gln Val Thr Ser Glu Glu Leu Val
 85 90 95
 Asn Met Ala Tyr Asp Ile Ile Ala Lys Glu Asn Pro Ser Leu Asn Ala
 100 105 110
 Val Ile Thr Thr Arg Arg Gln Glu Ala Ile Glu Glu Ala Arg Lys Leu
 115 120 125
 Lys Asp Thr Asn Gln Pro Phe Leu Gly Val Pro Leu Leu Val Lys Gly
 130 135 140

Leu Gly His Ser Ile Lys Gly Gly Glu Thr Asn Asn Gly Leu Ile Tyr
 145 150 155 160
 Ala Asp Gly Lys Ile Ser Thr Phe Asp Ser Ser Tyr Val Lys Lys Tyr
 165 170 175
 Lys Asp Leu Gly Phe Ile Ile Leu Gly Gln Thr Asn Phe Pro Glu Tyr
 180 185 190
 Gly Trp Arg Asn Ile Thr Asp Ser Lys Leu Tyr Gly Leu Thr His Asn
 195 200 205
 Pro Trp Asp Leu Ala His Asn Ala Gly Gly Ser Ser Gly Gly Ser Ala
 210 215 220
 Ala Ala Ile Ala Ser Gly Met Thr Pro Ile Ala Ser Gly Ser Asp Ala
 225 230 235 240
 Gly Gly Ser Ile Arg Ile Pro Ser Ser Trp Thr Gly Leu Val Gly Leu
 245 250 255
 Lys Pro Thr Arg Gly Leu Val Ser Asn Glu Lys Pro Asp Ser Tyr Ser
 260 265 270
 Thr Ala Val His Phe Pro Leu Thr Lys Ser Ser Arg Asp Ala Glu Thr
 275 280 285
 Leu Leu Thr Tyr Leu Lys Lys Ser Asp Gln Thr Leu Val Ser Val Asn
 290 295 300
 Asp Leu Lys Ser Leu Pro Ile Ala Tyr Thr Leu Lys Ser Pro Met Gly
 305 310 315 320
 Thr Glu Val Ser Gln Asp Ala Lys Asn Ala Ile Met Asp Asn Val Thr
 325 330 335
 Phe Leu Arg Lys Gln Gly Phe Lys Val Thr Glu Ile Asp Leu Pro Ile
 340 345 350
 Asp Gly Arg Ala Leu Met Arg Asp Tyr Ser Thr Leu Ala Ile Gly Met
 355 360 365
 Gly Gly Ala Phe Ser Thr Ile Glu Lys Asp Leu Lys Lys His Gly Phe
 370 375 380
 Thr Lys Glu Asp Val Asp Pro Ile Thr Trp Ala Val His Val Ile Tyr
 385 390 395 400
 Gln Asn Ser Asp Lys Ala Glu Leu Lys Lys Ser Ile Met Glu Ala Gln
 405 410 415
 Lys His Met Asp Asp Tyr Arg Lys Ala Met Glu Lys Leu His Lys Gln
 420 425 430
 Phe Pro Ile Phe Leu Ser Pro Thr Thr Ala Ser Leu Ala Pro Leu Asn
 435 440 445
 Thr Asp Pro Tyr Val Thr Glu Glu Asp Lys Arg Ala Ile Tyr Asn Met
 450 455 460
 Glu Asn Leu Ser Gln Glu Glu Arg Ile Ala Leu Phe Asn Arg Gln Trp
 465 470 475 480
 Glu Pro Met Leu Arg Arg Thr Pro Phe Thr Gln Ile Ala Asn Met Thr
 485 490 495
 Gly Leu Pro Ala Ile Ser Ile Pro Thr Tyr Leu Ser Glu Ser Gly Leu
 500 505 510
 Pro Ile Gly Thr Met Leu Met Ala Gly Ala Asn Tyr Asp Met Val Leu
 515 520 525
 Ile Lys Phe Ala Thr Phe Phe Glu Lys His His Gly Phe Asn Val Lys
 530 535 540
 Trp Gln Arg Ile Ile Asp Lys Glu Val Lys Pro Ser Thr Gly Leu Ile
 545 550 555 560
 Gln Pro Thr Asn Ser Leu Phe Lys Ala His Ser Ser Leu Val Asn Leu
 565 570 575
 Glu Glu Asn Ser Gln Val Thr Gln Val Ser Ile Ser Lys Lys Trp Met

50				55				60			
Ser Thr	Lys Leu	Thr Glu	Thr Tyr	Lys Gln	Lys Asp	Gly Gln	Asp	Gln Asp			
65		70			75			80			
Leu Ala	Asn Met	Val Arg	Ser Gly	Gln Val	Thr Ser	Glu Glu	Leu Val				
		85		90				95			
Asn Met	Ala Tyr	Asp Ile	Ile Ala	Lys Glu	Asn Pro	Ser Leu	Asn Ala				
		100		105				110			
Val Ile	Thr Thr	Arg Arg	Gln Glu	Ala Ile	Glu Glu	Ala Arg	Lys Leu				
		115		120				125			
Lys Asp	Thr Asn	Gln Pro	Phe Leu	Gly Val	Pro Leu	Leu Val	Lys Gly				
		130		135				140			
Leu Gly	His Ser	Ile Lys	Gly Gly	Glu Thr	Asn Asn	Gly Leu	Ile Tyr				
		150		155				160			
Ala Asp	Gly Lys	Ile Ser	Thr Phe	Asp Ser	Ser Tyr	Val Lys	Lys Tyr				
		165		170				175			
Lys Asp	Leu Gly	Phe Ile	Ile Leu	Gly Gln	Thr Asn	Phe Pro	Glu Tyr				
		180		185				190			
Gly Trp	Arg Asn	Ile Thr	Asp Ser	Lys Leu	Tyr Gly	Leu Thr	His Asn				
		195		200				205			
Pro Trp	Asp Leu	Ala His	Asn Ala	Gly Gly	Ser Ser	Gly Gly	Ser Ala				
		210		215				220			
Ala Ala	Ile Ala	Ser Gly	Met Thr	Pro Ile	Ala Ser	Gly Ser	Asp Ala				
		225		230				235			
Gly Gly	Ser Ile	Arg Ile	Pro Ser	Ser Trp	Thr Gly	Leu Val	Gly Leu				
		245		250				255			
Lys Pro	Thr Arg	Gly Leu	Val Ser	Asn Glu	Lys Pro	Asp Ser	Tyr Ser				
		260		265				270			
Thr Ala	Val His	Phe Pro	Leu Thr	Lys Ser	Ser Arg	Asp Ala	Glu Thr				
		275		280				285			
Leu Leu	Thr Tyr	Leu Lys	Lys Ser	Asp Gln	Thr Leu	Val Ser	Val Asn				
		290		295				300			
Asp Leu	Lys Ser	Leu Pro	Ile Ala	Tyr Thr	Leu Lys	Ser Pro	Met Gly				
		305		310				315			
Thr Glu	Val Ser	Gln Asp	Ala Lys	Asn Ala	Ile Met	Asp Asn	Val Thr				
		325		330				335			
Phe Leu	Arg Lys	Gln Gly	Phe Lys	Val Thr	Glu Ile	Asp Leu	Pro Ile				
		340		345				350			
Asp Gly	Arg Ala	Leu Met	Arg Asp	Tyr Ser	Thr Leu	Ala Ile	Gly Met				
		355		360				365			
Gly Gly	Ala Phe	Ser Thr	Ile Glu	Lys Asp	Leu Lys	Lys His	Gly Phe				
		370		375				380			
Thr Lys	Glu Asp	Val Asp	Pro Ile	Thr Trp	Ala Val	His Val	Ile Tyr				
		385		390				395			
Gln Asn	Ser Asp	Lys Ala	Glu Leu	Lys Ser	Ile Met	Glu Ala	Gln				
		405		410				415			
Lys His	Met Asp	Asp Tyr	Arg Lys	Ala Met	Glu Lys	Leu His	Lys Gln				
		420		425				430			
Phe Pro	Ile Phe	Leu Ser	Pro Thr	Thr Ala	Ser Leu	Ala Pro	Leu Asn				
		435		440				445			
Thr Asp	Pro Tyr	Val Thr	Glu Glu	Asp Lys	Arg Ala	Ile Tyr	Asn Met				
		450		455				460			
Glu Asn	Leu Ser	Gln Glu	Arg Ile	Ala Leu	Phe Asn	Arg Gln	Trp				
		465		470				475			
Glu Pro	Met Leu	Arg Arg	Thr Pro	Phe Thr	Gln Ile	Ala Asn	Met Thr				
		485		490				495			

Gly Leu Pro Ala Ile Ser Ile Pro Thr Tyr Leu Ser Glu Ser Gly Leu
500 505 510
Pro Ile Gly Thr Met Leu Met Ala Gly Ala Asn Tyr Asp Met Val Leu
515 520 525
Ile Lys Phe Ala Thr Phe Phe Glu Lys His His Gly Phe Asn Val Lys
530 535 540
Trp Gln Arg Ile Ile Asp Lys Glu Val Lys Pro Ser Thr Gly Leu Ile
545 550 555 560
Gln Pro Thr Asn Ser Leu Phe Lys Ala His Ser Ser Leu Val Asn Leu
565 570 575
Glu Glu Asn Ser Gln Val Thr Gln Val Ser Ile Ser Lys Lys Trp Met
580 585 590
Lys Ser Ser Val Lys Asn Lys
595

<210> 78
<211> 1020
<212> DNA
<213> Streptococcus agalactiae

<400> 78
atgaaacgta ttgctgtttt aactagtggg ggtgacgccc ctggtatgaa cgctgctatc 60
cgtgcagttg ttctgtaaag aatttctgaa ggtatggaag tttacggcat caaccaaggt 120
tactatggta tggtagacagg ggatattttc cctttggatg ctaattctgt tggggatact 180
atcaaccgtg aaggaacgtt ttacagttca gcacgtttatc ctgaatttgc tgaacttgaa 240
ggtcagctta aagggaattg acagctttaa aaacacggta ttgaaggtgt agtagttatc 300
gggtgtgatg gttcttatca tgggtctatg cgtctaaactg agcacggttt ccacagctgtt 360
ggtttgcggg ttacaattga taacgataac gttggcactg actatactat tggttttgac 420
acagcagttg cgacagcagt tgagaatctt gaccgtcttc gtgatacatc agcaagtcac 480
aaccgtactt ttgtgttga ggttatggga agaaatgcag gagatatcgc tctttgggtca 540
ggtagctgct caggtgcaga tcaaattatt gttcctgaag aagagttcaa tattgatgaa 600
gtgtgtctaa atgttagagc tggctatgca gctggttaaac atcaccaaat catcgtcctt 660
gcagaaggtg ttatgagtg tgatgagttt gcaaaaaaaa tgaagcagc agggagacgat 720
agcgatcttc gtgtgacgaa tttaggacat ctgctccgtg gtggttagtcc gacggctcgt 780
gatcgtgtct tagcatctcg tatgggagcg tacgctgttc aattgttgaa agaaggtcgt 840
gggtggttag ccgttgggtg ccacaacgaa gaaatgggtg aaagtccaat tttaggttta 900
gcagaagaag gtgctttgtt cagcttgact gatgaaggaa aaatcgttgt taataatccg 960
cataaagcgg accttcgctt ggcagcactt aatcgtgacc ttgccaacca aagtagtaaa 1020

<210> 79
<211> 340
<212> PRT
<213> Streptococcus agalactiae

<400> 79
Met Lys Arg Ile Ala Val Leu Thr Ser Gly Gly Asp Ala Pro Gly Met
1 5 10 15
Asn Ala Ala Ile Arg Ala Val Val Arg Lys Ala Ile Ser Glu Gly Met
20 25 30
Glu Val Tyr Gly Ile Asn Gln Gly Tyr Tyr Gly Met Val Thr Gly Asp
35 40 45
Ile Phe Pro Leu Asp Ala Asn Ser Val Gly Asp Thr Ile Asn Arg Gly
50 55 60
Gly Thr Phe Leu Arg Ser Ala Arg Tyr Pro Glu Phe Ala Glu Leu Glu
65 70 75 80

Gly Gln Leu Lys Gly Ile Glu Gln Leu Lys Lys His Gly Ile Glu Gly
 85 90 95
 Val Val Val Ile Gly Gly Asp Gly Ser Tyr His Gly Ala Met Arg Leu
 100 105 110
 Thr Glu His Gly Phe Pro Ala Val Gly Leu Pro Gly Thr Ile Asp Asn
 115 120 125
 Asp Ile Val Gly Thr Asp Tyr Thr Ile Gly Phe Asp Thr Ala Val Ala
 130 135 140
 Thr Ala Val Glu Asn Leu Asp Arg Leu Arg Asp Thr Ser Ala Ser His
 145 150 155 160
 Asn Arg Thr Phe Val Val Glu Val Met Gly Arg Asn Ala Gly Asp Ile
 165 170 175
 Ala Leu Trp Ser Gly Ile Ala Ala Gly Ala Asp Gln Ile Ile Val Pro
 180 185 190
 Glu Glu Glu Phe Asn Ile Asp Glu Val Val Ser Asn Val Arg Ala Gly
 195 200 205
 Tyr Ala Ala Gly Lys His His Gln Ile Ile Val Leu Ala Glu Gly Val
 210 215 220
 Met Ser Gly Asp Glu Phe Ala Lys Thr Met Lys Ala Ala Gly Asp Asp
 225 230 235 240
 Ser Asp Leu Arg Val Thr Asn Leu Gly His Leu Leu Arg Gly Gly Ser
 245 250 255
 Pro Thr Ala Arg Asp Arg Val Leu Ala Ser Arg Met Gly Ala Tyr Ala
 260 265 270
 Val Gln Leu Leu Lys Glu Gly Arg Gly Gly Leu Ala Val Gly Val His
 275 280 285
 Asn Glu Glu Met Val Glu Ser Pro Ile Leu Gly Leu Ala Glu Glu Gly
 290 295 300
 Ala Leu Phe Ser Leu Thr Asp Glu Gly Lys Ile Val Val Asn Asn Pro
 305 310 315 320
 His Lys Ala Asp Leu Arg Leu Ala Ala Leu Asn Arg Asp Leu Ala Asn
 325 330 335
 Gln Ser Ser Lys
 340

<210> 80
 <211> 2070
 <212> DNA
 <213> Streptococcus agalactiae

<400> 80
 atgaaaaaga aaattatttt gaaaagtagt gttcttggtt tagtgcgtcg gacttctatt 60
 atgtttctcaa gcgtgttcgc ggaccaagtc ggtgtccaag ttataggcgt caatgacttt 120
 catggtgcac ttgacaatac tgaacacgca aatatgcctg atggaagaat tgctaatgct 180
 ggtactgctg ctcaattaga tgcttatatg gatgacgctc aaaaagattt caaacaaact 240
 aaccctaagt gtgaaagcat tagggttcaa gcaggcgata tggttggagc aagtcagacc 300
 aactctgggc ttcttcaaga tgaaccaact gtcaaaaatt ttaatgcaat gaatgttgag 360
 tatggcacat tgggtaacca tgaatttgat gaagggttgg cagaatataa tcgtatcggt 420
 actggttaag ccctctgctc agattctaat attaataata ttacgaaatc ataccacat 480
 gaagctgcaa aacaagaaat tgtagtgcca aatgtttatt ataaagttaa caaacaaatt 540
 ccttacaatt ggaagcctta cgctattaaa aatattcctg taaataacaa aagtgtgaac 600
 ttgtgcttta tcgggattgt caccaaaagc atcccaaacg ttgtcttacg taataattat 660
 gaacaatatg aatttttata tgaagctgaa acaatcgtaa aatacgccaa agaattacaa 720
 gctaaaaaat tcaaatgcat ttagttcttc gcacatgtac ctgcaacaag taaaaatgat 780
 attgctgaag gtgaagcagc agaaatgatg aaaaagtcac atcaactctt ccttgaaaaa 840

```

agcgtagata ttgtctttgc tggacacaat catcaatata caaatgggtct tgttggtataa 900
actcgtattg tacaagcgct ctctcaagga aaagcctatg ctgatgtacg tgggtgtctta 960
gatactgata cacaagattt cattgagacc ccttcagcta aagtaattgc agttgtctct 1020
ggtaaaaaaa caggtagtg cgaatttcaa gccattgttg accaagctaa tactatcggt 1080
aaacaagtaa cagaagctaa aattgggtact gcgcaggtaa gtgtcatgat tacgcgttct 1140
gttgtaacag ataattgttag tccggtaggc agcctcatca cagaggctca atcagaattt 1200
gtctgaaaaa gctggccaga tatcgatttt gccatgacaa ataattggtg cattcgtgct 1260
gacttactca tcaaacacaga tgaacaacat acctggggag ctgcacaagc agttcaacct 1320
tttggtaata tcttacaagt cgtcgaaatt actggtagag atctttataa agcactcaac 1380
gaacaatacg accaaaaaca aaatttcttc ctccaatag ctggctctgc atacacttac 1440
acagataata aagaggcgcg ggaagaaaac ccatttaaag ttgtaaaagc ttataaatca 1500
aatggtgagg aaatcaatcc tgatgcaaaa tacaattagg ttatcaatga ctttttatct 1560
gttggtgggt atggctttgc aagcttcaga aatgccaaac ttctaggagc cattaacccc 1620
gatacagagg tatttatggc ctatatcact gatthagaaa aagctggtaa aaaagtgagc 1680
gttccaaata ataaacctaa aatctatgct actatgaaga tggtaataga aactattaca 1740
caaaatgatg gtacacatag cattattaa gaaactttatt tagatcgaca aggaaatatt 1800
gtagcacaag agattgtatc agacacttta aaccaaaaca aatcaaaaatc tacaaaaatc 1860
aacccctgta ctacaattca caaaaaacaa ttacaccaat ttacagctat taacccctatg 1920
agaaattatg gcaaacccat aaactccact actgtaaaat caaaacaatt accaaaaaca 1980
aactctgaat atggacaatc attccttatg tctgtctttg gtgttggtact tataggaatt 2040
gctttaaata caaagaaaaa acatatgaaa 2070

```

```

<210> 81
<211> 690
<212> PRT
<213> Streptococcus agalactiae

```

```

<400> 81
Met Lys Lys Lys Ile Ile Leu Lys Ser Ser Val Leu Gly Leu Val Ala
1 5 10 15
Gly Thr Ser Ile Met Phe Ser Ser Val Phe Ala Asp Gln Val Gly Val
20 25 30
Gln Val Ile Gly Val Asn Asp Phe His Gly Ala Leu Asp Asn Thr Gly
35 40 45
Thr Ala Asn Met Pro Asp Gly Lys Val Ala Asn Ala Gly Thr Ala Ala
50 55 60
Gln Leu Asp Ala Tyr Met Asp Asp Ala Gln Lys Asp Phe Lys Gln Thr
65 70 75 80
Asn Pro Asn Gly Glu Ser Ile Arg Val Gln Ala Gly Asp Met Val Gly
85 90 95
Ala Ser Pro Ala Asn Ser Gly Leu Leu Gln Asp Glu Pro Thr Val Lys
100 105 110
Asn Phe Asn Ala Met Asn Val Glu Tyr Gly Thr Leu Gly Asn His Glu
115 120 125
Phe Asp Glu Gly Leu Ala Glu Tyr Asn Arg Ile Val Thr Gly Lys Ala
130 135 140
Pro Ala Pro Asp Ser Asn Ile Asn Asn Ile Thr Lys Ser Tyr Pro His
145 150 155 160
Glu Ala Ala Lys Gln Glu Ile Val Val Ala Asn Val Ile Asp Lys Val
165 170 175
Asn Lys Gln Ile Pro Tyr Asn Trp Lys Pro Tyr Ala Ile Lys Asn Ile
180 185 190
Pro Val Asn Asn Lys Ser Val Asn Val Gly Phe Ile Gly Ile Val Thr
195 200 205
Lys Asp Ile Pro Asn Leu Val Leu Arg Lys Asn Tyr Glu Gln Tyr Glu

```

210		215		220
Phe Leu Asp Glu Ala Glu Thr Ile Val Lys Tyr Ala Lys Glu Leu Gln				
225		230		240
Ala Lys Asn Val Lys Ala Ile Val Val Leu Ala His Val Pro Ala Thr				
	245		250	255
Ser Lys Asn Asp Ile Ala Glu Gly Glu Ala Ala Glu Met Met Lys Lys				
	260		265	270
Val Asn Gln Leu Phe Pro Glu Asn Ser Val Asp Ile Val Phe Ala Gly				
	275		280	285
His Asn His Gln Tyr Thr Asn Gly Leu Val Gly Lys Thr Arg Ile Val				
	290		295	300
Gln Ala Leu Ser Gln Gly Lys Ala Tyr Ala Asp Val Arg Gly Val Leu				
	310		315	320
Asp Thr Asp Thr Gln Asp Phe Ile Glu Thr Pro Ser Ala Lys Val Ile				
	325		330	335
Ala Val Ala Pro Gly Lys Lys Thr Gly Ser Ala Asp Ile Gln Ala Ile				
	340		345	350
Val Asp Gln Ala Asn Thr Ile Val Lys Gln Val Thr Glu Ala Lys Ile				
	355		360	365
Gly Thr Ala Glu Val Ser Val Met Ile Thr Arg Ser Val Asp Gln Asp				
	370		375	380
Asn Val Ser Pro Val Gly Ser Leu Ile Thr Glu Ala Gln Leu Ala Ile				
	385		390	400
Ala Arg Lys Ser Trp Pro Asp Ile Asp Phe Ala Met Thr Asn Asn Gly				
	405		410	415
Gly Ile Arg Ala Asp Leu Leu Ile Lys Pro Asp Gly Thr Ile Thr Trp				
	420		425	430
Gly Ala Ala Gln Ala Val Gln Pro Phe Gly Asn Ile Leu Gln Val Val				
	435		440	445
Glu Ile Thr Gly Arg Asp Leu Tyr Lys Ala Leu Asn Glu Gln Tyr Asp				
	450		455	460
Gln Lys Gln Asn Phe Phe Leu Gln Ile Ala Gly Leu Arg Tyr Thr Tyr				
	465		470	475
Thr Asp Asn Lys Glu Gly Gly Glu Glu Thr Pro Phe Lys Val Val Lys				
	485		490	495
Ala Tyr Lys Ser Asn Gly Glu Glu Ile Asn Pro Asp Ala Lys Tyr Lys				
	500		505	510
Leu Val Ile Asn Asp Phe Leu Phe Gly Gly Asp Gly Phe Ala Ser				
	515		520	525
Phe Arg Asn Ala Lys Leu Leu Gly Ala Ile Asn Pro Asp Thr Glu Val				
	530		535	540
Phe Met Ala Tyr Ile Thr Asp Leu Glu Lys Ala Gly Lys Lys Val Ser				
	545		550	555
Val Pro Asn Asn Lys Pro Lys Ile Tyr Val Thr Met Lys Met Val Asn				
	565		570	575
Glu Thr Ile Thr Gln Asn Asp Gly Thr His Ser Ile Ile Lys Lys Leu				
	580		585	590
Tyr Leu Asp Arg Gln Gly Asn Ile Val Ala Gln Glu Ile Val Ser Asp				
	595		600	605
Thr Leu Asn Gln Thr Lys Ser Lys Ser Thr Lys Ile Asn Pro Val Thr				
	610		615	620
Thr Ile His Lys Lys Gln Leu His Gln Phe Thr Ala Ile Asn Pro Met				
	625		630	635
Arg Asn Tyr Gly Lys Pro Ser Asn Ser Thr Thr Val Lys Ser Lys Gln				
	640		645	650


```

325          330          335
Ile Thr Arg Ser Val Asp Gln Asp Asn Val Ser Pro Val Gly Ser Leu
340          345          350
Ile Thr Glu Ala Gln Leu Ala Ile Ala Arg Lys Ser Trp Pro Asp Ile
355          360          365
Asp Phe Ala Met Thr Asn Asn Gly Gly Ile Arg Ala Asp Leu Leu Ile
370          375          380
Lys Pro Asp Gly Thr Ile Thr Trp Gly Ala Ala Gln Ala Val Gln Pro
385          390          395
Phe Gly Asn Ile Leu Gln Val Val Glu Ile Thr Gly Arg Asp Leu Tyr
400          405          410          415
Lys Ala Leu Asn Glu Gln Tyr Asp Gln Lys Gln Asn Phe Phe Leu Gln
420          425          430
Ile Ala Gly Leu Arg Tyr Thr Tyr Thr Asp Asn Lys Glu Gly Gly Glu
435          440          445
Glu Thr Pro Phe Lys Val Val Lys Ala Tyr Lys Ser Asn Gly Glu Glu
450          455          460
Ile Asn Pro Asp Ala Lys Tyr Lys Leu Val Ile Asn Asp Phe Leu Phe
465          470          475
Gly Gly Gly Asp Gly Phe Ala Ser Phe Arg Asn Ala Lys Leu Leu Gly
480          485          490          495
Ala Ile Asn Pro Asp Thr Glu Val Phe Met Ala Tyr Ile Thr Asp Leu
500          505          510
Glu Lys Ala Gly Lys Lys Val Ser Val Pro Asn Asn Lys Pro Lys Ile
515          520          525
Tyr Val Thr Met Lys Met Val Asn Glu Thr Ile Thr Gln Asn Asp Gly
530          535          540
Thr His Ser Ile Ile Lys Lys Leu Tyr Leu Asp Arg Gln Gly Asn Ile
545          550          555
Val Ala Gln Glu Ile Val Ser Asp Thr Leu Asn Gln Thr Lys Ser Lys
560          565          570          575
Ser Thr Lys Ile Asn Pro Val Thr Thr Ile His Lys Lys Gln Leu His
580          585          590
Gln Phe Thr Ala Ile Asn Pro Met Arg Asn Tyr Gly Lys Pro Ser Asn
595          600          605
Ser Thr Thr Val Lys Ser Lys Gln Leu Pro Lys Thr Asn Ser Glu Tyr
610          615          620
Gly Gln Ser Phe Leu Met Ser Val Phe Gly Val Gly Leu Ile Gly Ile
625          630          635          640
Ala Leu Asn Thr Lys Lys Lys His Met Lys
645          650

```

```

<210> 83
<211> 654
<212> PRT
<213> Streptococcus agalactiae

```

```

<400> 83
Met Lys Lys Lys Ile Ile Leu Lys Ser Ser Val Leu Gly Leu Val Ala
1          5          10          15
Gly Thr Ser Ile Met Phe Ser Ser Val Phe Ala Asp Gln Val Gly Val
20          25          30
Gln Val Ile Gly Val Asn Asp Phe His Gly Ala Leu Asp Asn Thr Gly
35          40          45
Thr Ala Asn Met Pro Asp Gly Lys Val Ala Asn Ala Gly Thr Ala Ala

```

50					55				60						
Gln	Leu	Asp	Ala	Tyr	Met	Asp	Asp	Ala	Gln	Lys	Asp	Phe	Lys	Gln	Thr
65					70				75					80	
Asn	Pro	Asn	Gly	Glu	Ser	Ile	Arg	Val	Gln	Ala	Gly	Asp	Met	Val	Gly
			85					90						95	
Ala	Ser	Pro	Ala	Asn	Ser	Gly	Leu	Leu	Gln	Asp	Glu	Pro	Thr	Val	Lys
			100					105						110	
Asn	Phe	Asn	Ala	Met	Asn	Val	Glu	Tyr	Gly	Thr	Leu	Gly	Asn	His	Glu
			115				120					125			
Phe	Asp	Glu	Gly	Leu	Ala	Glu	Tyr	Asn	Arg	Ile	Val	Thr	Gly	Lys	Ala
			130				135				140				
Pro	Ala	Pro	Asp	Ser	Asn	Ile	Asn	Asn	Ile	Thr	Lys	Ser	Tyr	Pro	His
					150					155				160	
Glu	Ala	Ala	Lys	Gln	Glu	Ile	Val	Val	Ala	Asn	Val	Ile	Asp	Lys	Val
				165					170					175	
Asn	Lys	Gln	Ile	Pro	Tyr	Asn	Trp	Lys	Pro	Tyr	Ala	Ile	Lys	Asn	Ile
			180					185					190		
Pro	Val	Asn	Asn	Lys	Ser	Val	Asn	Val	Gly	Phe	Ile	Gly	Ile	Val	Thr
			195				200					205			
Lys	Asp	Ile	Pro	Asn	Leu	Val	Leu	Arg	Lys	Asn	Tyr	Glu	Gln	Tyr	Glu
			210				215				220				
Phe	Leu	Asp	Glu	Ala	Glu	Thr	Ile	Val	Lys	Tyr	Ala	Lys	Glu	Leu	Gln
			225				230			235				240	
Ala	Lys	Asn	Val	Lys	Ala	Ile	Val	Val	Leu	Ala	His	Val	Pro	Ala	Thr
				245					250					255	
Ser	Lys	Asn	Asp	Ile	Ala	Glu	Gly	Glu	Ala	Ala	Glu	Met	Met	Lys	Lys
			260					265					270		
Val	Asn	Gln	Leu	Phe	Pro	Glu	Asn	Ser	Val	Asp	Ile	Val	Phe	Ala	Gly
			275				280					285			
His	Asn	His	Gln	Tyr	Thr	Asn	Gly	Leu	Val	Gly	Lys	Thr	Arg	Ile	Val
			290				295				300				
Gln	Ala	Leu	Ser	Gln	Gly	Lys	Ala	Tyr	Ala	Asp	Val	Arg	Gly	Val	Leu
			305			310				315				320	
Asp	Thr	Asp	Thr	Gln	Asp	Phe	Ile	Glu	Thr	Pro	Ser	Ala	Lys	Val	Ile
				325					330					335	
Ala	Val	Ala	Pro	Gly	Lys	Lys	Thr	Gly	Ser	Ala	Asp	Ile	Gln	Ala	Ile
			340					345					350		
Val	Asp	Gln	Ala	Asn	Thr	Ile	Val	Lys	Gln	Val	Thr	Glu	Ala	Lys	Ile
			355				360					365			
Gly	Thr	Ala	Glu	Val	Ser	Val	Met	Ile	Thr	Arg	Ser	Val	Asp	Gln	Asp
			370				375				380				
Asn	Val	Ser	Pro	Val	Gly	Ser	Leu	Ile	Thr	Glu	Ala	Gln	Leu	Ala	Ile
				385		390				395				400	
Ala	Arg	Lys	Ser	Trp	Pro	Asp	Ile	Asp	Phe	Ala	Met	Thr	Asn	Asn	Gly
				405					410					415	
Gly	Ile	Arg	Ala	Asp	Leu	Leu	Ile	Lys	Pro	Asp	Gly	Thr	Ile	Thr	Trp
			420					425					430		
Gly	Ala	Ala	Gln	Ala	Val	Gln	Pro	Phe	Gly	Asn	Ile	Leu	Gln	Val	Val
			435				440					445			
Glu	Ile	Thr	Gly	Arg	Asp	Leu	Tyr	Lys	Ala	Leu	Asn	Glu	Gln	Tyr	Asp
			450				455				460				
Gln	Lys	Gln	Asn	Phe	Phe	Leu	Gln	Ile	Ala	Gly	Leu	Arg	Tyr	Thr	Tyr
				465		470				475				480	
Thr	Asp	Asn	Lys	Glu	Gly	Gly	Glu	Glu	Thr	Pro	Phe	Lys	Val	Val	Lys
				485					490					495	

Ala Tyr Lys Ser Asn Gly Glu Glu Ile Asn Pro Asp Ala Lys Tyr Lys
500 505 510
Leu Val Ile Asn Asp Phe Leu Phe Gly Gly Gly Asp Gly Phe Ala Ser
515 520 525
Phe Arg Asn Ala Lys Leu Leu Gly Ala Ile Asn Pro Asp Thr Glu Val
530 535 540
Phe Met Ala Tyr Ile Thr Asp Leu Glu Lys Ala Gly Lys Lys Val Ser
545 550 555 560
Val Pro Asn Asn Lys Pro Lys Ile Tyr Val Thr Met Lys Met Val Asn
565 570 575
Glu Thr Ile Thr Gln Asn Asp Gly Thr His Ser Ile Ile Lys Lys Leu
580 585 590
Tyr Leu Asp Arg Gln Gly Asn Ile Val Ala Gln Glu Ile Val Ser Asp
595 600 605
Thr Leu Asn Gln Thr Lys Ser Lys Ser Thr Lys Ile Asn Pro Val Thr
610 615 620
Thr Ile His Lys Lys Gln Leu His Gln Phe Thr Ala Ile Asn Pro Met
625 630 635 640
Arg Asn Tyr Gly Lys Pro Ser Asn Ser Thr Thr Val Lys Ser
645 650

<210> 84

<211> 614

<212> PRT

<213> Streptococcus agalactiae

<400> 84

His Gly Ala Leu Asp Asn Thr Gly Thr Ala Asn Met Pro Asp Gly Lys
1 5 10 15
Val Ala Asn Ala Gly Thr Ala Ala Gln Leu Asp Ala Tyr Met Asp Asp
20 25 30
Ala Gln Lys Asp Phe Lys Gln Thr Asn Pro Asn Gly Glu Ser Ile Arg
35 40 45
Val Gln Ala Gly Asp Met Val Gly Ala Ser Pro Ala Asn Ser Gly Leu
50 55 60
Leu Gln Asp Glu Pro Thr Val Lys Asn Phe Asn Ala Met Asn Val Glu
65 70 75 80
Tyr Gly Thr Leu Gly Asn His Glu Phe Asp Glu Gly Leu Ala Glu Tyr
85 90 95
Asn Arg Ile Val Thr Gly Lys Ala Pro Ala Pro Asp Ser Asn Ile Asn
100 105 110
Asn Ile Thr Lys Ser Tyr Pro His Glu Ala Ala Lys Gln Glu Ile Val
115 120 125
Val Ala Asn Val Ile Asp Lys Val Asn Lys Gln Ile Pro Tyr Asn Trp
130 135 140
Lys Pro Tyr Ala Ile Lys Asn Ile Pro Val Asn Asn Lys Ser Val Asn
145 150 155 160
Val Gly Phe Ile Gly Ile Val Thr Lys Asp Ile Pro Asn Leu Val Leu
165 170 175
Arg Lys Asn Tyr Glu Gln Tyr Glu Phe Leu Asp Glu Ala Glu Thr Ile
180 185 190
Val Lys Tyr Ala Lys Glu Leu Gln Ala Lys Asn Val Lys Ala Ile Val
195 200 205
Val Leu Ala His Val Pro Ala Thr Ser Lys Asn Asp Ile Ala Glu Gly
210 215 220

Glu Ala Ala Glu Met Met Lys Lys Val Asn Gln Leu Phe Pro Glu Asn
 225 230 235 240
 Ser Val Asp Ile Val Phe Ala Gly His Asn His Gln Tyr Thr Asn Gly
 245 250 255
 Leu Val Gly Lys Thr Arg Ile Val Gln Ala Leu Ser Gln Gly Lys Ala
 260 265 270
 Tyr Ala Asp Val Arg Gly Val Leu Asp Thr Asp Thr Gln Asp Phe Ile
 275 280 285
 Glu Thr Pro Ser Ala Lys Val Ile Ala Val Ala Pro Gly Lys Lys Thr
 290 295 300
 Gly Ser Ala Asp Ile Gln Ala Ile Val Asp Gln Ala Asn Thr Ile Val
 305 310 315 320
 Lys Gln Val Thr Glu Ala Lys Ile Gly Thr Ala Glu Val Ser Val Met
 325 330 335
 Ile Thr Arg Ser Val Asp Gln Asp Asn Val Ser Pro Val Gly Ser Leu
 340 345 350
 Ile Thr Glu Ala Gln Leu Ala Ile Ala Arg Lys Ser Trp Pro Asp Ile
 355 360 365
 Asp Phe Ala Met Thr Asn Asn Gly Gly Ile Arg Ala Asp Leu Leu Ile
 370 375 380
 Lys Pro Asp Gly Thr Ile Thr Trp Gly Ala Ala Gln Ala Val Gln Pro
 385 390 395 400
 Phe Gly Asn Ile Leu Gln Val Val Glu Ile Thr Gly Arg Asp Leu Tyr
 405 410 415
 Lys Ala Leu Asn Glu Gln Tyr Asp Gln Lys Gln Asn Phe Phe Leu Gln
 420 425 430
 Ile Ala Gly Leu Arg Tyr Thr Tyr Thr Asp Asn Lys Glu Gly Gly Glu
 435 440 445
 Glu Thr Pro Phe Lys Val Val Lys Ala Tyr Lys Ser Asn Gly Glu Glu
 450 455 460
 Ile Asn Pro Asp Ala Lys Tyr Lys Leu Val Ile Asn Asp Phe Leu Phe
 465 470 475 480
 Gly Gly Gly Asp Gly Phe Ala Ser Phe Arg Asn Ala Lys Leu Leu Gly
 485 490 495
 Ala Ile Asn Pro Asp Thr Glu Val Phe Met Ala Tyr Ile Thr Asp Leu
 500 505 510
 Glu Lys Ala Gly Lys Lys Val Ser Val Pro Asn Asn Lys Pro Lys Ile
 515 520 525
 Tyr Val Thr Met Lys Met Val Asn Glu Thr Ile Thr Gln Asn Asp Gly
 530 535 540
 Thr His Ser Ile Ile Lys Lys Leu Tyr Leu Asp Arg Gln Gly Asn Ile
 545 550 555 560
 Val Ala Gln Glu Ile Val Ser Asp Thr Leu Asn Gln Thr Lys Ser Lys
 565 570 575
 Ser Thr Lys Ile Asn Pro Val Thr Thr Ile His Lys Lys Gln Leu His
 580 585 590
 Gln Phe Thr Ala Ile Asn Pro Met Arg Asn Tyr Gly Lys Pro Ser Asn
 595 600 605
 Ser Thr Thr Val Lys Ser
 610

<210> 85
 <211> 783
 <212> DNA
 <213> Streptococcus agalactiae

<400> 85
atgaaaagat tacataaaact gtttataacc gtaattgcta cattaggtat gttgggggta 60
atgacctttg gtcttccaac gcagccgcaa aacgtaacgc cgatagtaca tgctgatgtc 120
aattcatctg ttgatacagc ccaggaattt caaaataatt taaaaaatgc tattggtaac 180
ctaccatttc aatatgttaa tggatattat gaattaaata ataactcagc aaattttaat 240
gctgatgtca atgttaaagc gtatgttcaa aatacaattg acaatcaaca aagactatca 300
actgctaagt caatgcttga tagaaccatt cgtcaatcgc aaaatcgcag agataccact 360
cttcccgatg caaattggaa accattaggt tggcatcaag tagctactaa tgaccattat 420
ggacatgcag tcgacaaggg gcatttaatt gcctatgctt tagctggaat tttcaaaggt 480
tgggatgctt ccgtgtcaaa tcctcaaaat gttgtcacac aaacagctca ttccaaccaa 540
tcaaatcaaa aaatcaatgc tggacaaaat tattatgaaa gcttagttcg taaggcgggt 600
gaccaaaaca aacgtgttcg ttaccgtgta actccattgt accgtaatga tactgattta 660
gttccatttg caatgcacct agaagctaaa tcacaagatg gcacattaga atttaattgt 720
gctattccaa acacacaagc atcatacact atggattatg caacaggaga aataacacta 780
aat 783

<210> 86
<211> 261
<212> PRT
<213> Streptococcus agalactiae

<400> 86
Met Lys Arg Leu His Lys Leu Phe Ile Thr Val Ile Ala Thr Leu Gly
1 5 10 15
Met Leu Gly Val Met Thr Phe Gly Leu Pro Thr Gln Pro Gln Asn Val
20 25 30
Thr Pro Ile Val His Ala Asp Val Asn Ser Ser Val Asp Thr Ser Gln
35 40 45
Glu Phe Gln Asn Asn Leu Lys Asn Ala Ile Gly Asn Leu Pro Phe Gln
50 55 60
Tyr Val Asn Gly Ile Tyr Glu Leu Asn Asn Asn Gln Thr Asn Leu Asn
65 70 75 80
Ala Asp Val Asn Val Lys Ala Tyr Val Gln Asn Thr Ile Asp Asn Gln
85 90 95
Gln Arg Leu Ser Thr Ala Asn Ala Met Leu Asp Arg Thr Ile Arg Gln
100 105 110
Tyr Gln Asn Arg Arg Asp Thr Thr Leu Pro Asp Ala Asn Trp Lys Pro
115 120 125
Leu Gly Trp His Gln Val Ala Thr Asn Asp His Tyr Gly His Ala Val
130 135 140
Asp Lys Gly His Leu Ile Ala Tyr Ala Leu Ala Gly Asn Phe Lys Gly
145 150 155 160
Trp Asp Ala Ser Val Ser Asn Pro Gln Asn Val Val Thr Gln Thr Ala
165 170 175
His Ser Asn Gln Ser Asn Gln Lys Ile Asn Arg Gly Gln Asn Tyr Tyr
180 185 190
Glu Ser Leu Val Arg Lys Ala Val Asp Gln Asn Lys Arg Val Arg Tyr
195 200 205
Arg Val Thr Pro Leu Tyr Arg Asn Asp Thr Asp Leu Val Pro Phe Ala
210 215 220
Met His Leu Glu Ala Lys Ser Gln Asp Gly Thr Leu Glu Phe Asn Val
225 230 235 240
Ala Ile Pro Asn Thr Gln Ala Ser Tyr Thr Met Asp Tyr Ala Thr Gly
245 250 255

Glu Ile Thr Leu Asn
260

<210> 87
<211> 2703
<212> DNA
<213> Streptococcus agalactiae

```

<400> 87
atgagaaatt accaaaaaatt ttctaaaaata ttgacgttaa gtctttttttg ttgtgcgcaa      60
ataccgctta ataccaatgt tttaggggaa agtaccgtac cggaatatgg tgctaaagga      120
aagttagtgt ttaaaaagac agatgaccag acaaaaccac ttccaaaagc taccttttgtt      180
ttaaaaaacta ctgctcatcc agaaagtaaa atagaaaaag taactgctga gctaacaggt      240
gaagctactt ttgataactc catacctgga gattatactt tatcagaaga aacagcgccc      300
gaaggttaaa aaaagactaa ccagacttgg caagttaagg ttgagagtaa tggaaaaact      360
acgatacaaa atagtgggtg taaaaattcc acaattggac aaaaacagga agaactagat      420
aagcagtatc cccccaacag aatttatgaa gatacaaaag aatctataa acttgagcat      480
gttaaagggt cagtcccaa tggaagtca gaggcaaaag cagttaaccc atattcaagt      540
gaaggtgagc atataagaga aattccagag ggaacattat ctaaacgtat ttcagaagta      600
gggtgattag ctcataataa atataaaatt gagttaactg tcagtgaaa aaccatagta      660
aaaccagtg gcccgttagat gttgtcttcg tactcgataa ttctaactca      720
atgaataacg atggcccaaa ttttcaaagg cataataaag ccaagaaaagc tgcgaagct      780
ctggggaccg cagtaaaaaga tatttttaga gcaaacagtg ataattgggt tgcattagtt      840
accatgggtt cagatatatt ttgatggtag agtgtagatg tcgtaaaagg atttaaagg      900
gatgataaatt attatggcct tcaaaactaag ttccacaattc agacagagaa ttatagtcatt      960
aaacaattaa caaataatgc tgaagagatt ataaaaagga ttccgcagaga agctccctaaa      1020
gctaagtggt gatctactac caatggatta actccagagc aacaaaagga gtactatctt      1080
agtaaaagtg gagaaacatt tactatgaaa gccttcattg aggcagatga tattttgagt      1140
caagtaaatc gaaatagtca aaaaattatt gtctcatgta ctgatgggtg tctcacgaga      1200
tcatatgcta ttaataattt taaactgggt gcatcatatg aaagccaatt tgaacaaatg      1260
aaaaaaaatg gatattctaa taaaagtaat ttctactta ctgataagcc cgaggatata      1320
aaaggaaaat gggagagtta ctttttgttt cccttagata gttatcaaac acagataatc      1380
tctggaaact tacaaaaact tcattattta gatttaaatc ttaattacc taaaggtaac      1440
atttatcgaa atggaccagt gaaagaacat ggaacaccaa ccaaaactta tataaatagt      1500
ttaaaacaga aaattatga catttttaat ttgggtatcg atatatctg tttagacaa      1560
gtttataatg aggagtataa gaaaaatcaa gatggtactt ttcaaaaatt tgaagaggaa      1620
gcttttaaac ttccagatgt agaaatcaca gaactaatga ggtctgtctc ttccaaaact      1680
gagtaactaca cccctatcgt aacttcagcc gatacatcta acaatgaaat ttatctcaa      1740
attcagcaac aatttgaac gattttaaca aagaaaaact caattgttaa tggaaactac      1800
gaagatccta tgggtgataa aatcaattta cagcttggtg atggacaaa actacagcca      1860
agtattataa ctttacaggg aaatgatgga agtgtaatga aggatggtat tgcaactggt      1920
gggcctaata atgatgggtg aataacttaag ggggttaaat tagaatacat cggaataata      1980
ctctatgtta gaggtttgaa tttaggagaa ggtcaaaaag taacactcac atatgtgtg      2040
aaactagatg acagttttat aagtaacaaa ttctatgaca ctaatggtag aacaacattg      2100
aatcctaagt caagagatcc taatacactt agagattttc caatccctaa aattcgtgat      2160
gtgagagaa atcctacaa acagattaaa aacgagaaga agttaggtga aattgaattt      2220
ataaaagtgt ataaagataa taataagttg cttctcaaa gactactcgt tgaactcaa      2280
gaatttaagt aagattataa actttattta ccaataaaaa ataaatgagt tgaagtgtg      2340
acgggagaaa acggcaaaa ttcttacaac gatttgaag atggcaaat tcagttaata      2400
gaagcagttt gcgcggagga ttatcaaaaa attactaata aaccaatttt aacttttgaa      2460
gtggttaaa gatcgataaa aataataata gctgttaata aacagatttc tgaatatcat      2520
gaggaagggt acaagcattt atttaccac acgcataatt caccaaaagg aattattctc      2580
atgacaggtg ggaaggaa tctatctttc attttaatg gtggagctat gatgtctatt      2640
gcaggtggaa ttatatattg gaaaaggtat aagaaatcta gtgatgtgc catcaaaaaa      2700
gat                                                    2703

```

<210> 88
 <211> 901
 <212> PRT
 <213> Streptococcus agalactiae

<400> 88
 Met Arg Lys Tyr Gln Lys Phe Ser Lys Ile Leu Thr Leu Ser Leu Phe
 1 5 10 15
 Cys Leu Ser Gln Ile Pro Leu Asn Thr Asn Val Leu Gly Glu Ser Thr
 20 25 30
 Val Pro Glu Asn Gly Ala Lys Gly Lys Leu Val Val Lys Lys Thr Asp
 35 40 45
 Asp Gln Asn Lys Pro Leu Ser Lys Ala Thr Phe Val Leu Lys Thr Thr
 50 55 60
 Ala His Pro Glu Ser Lys Ile Glu Lys Val Thr Ala Glu Leu Thr Gly
 65 70 75 80
 Glu Ala Thr Phe Asp Asn Leu Ile Pro Gly Asp Tyr Thr Leu Ser Glu
 85 90 95
 Glu Thr Ala Pro Glu Gly Tyr Lys Lys Thr Asn Gln Thr Trp Gln Val
 100 105 110
 Lys Val Glu Ser Asn Gly Lys Thr Thr Ile Gln Asn Ser Gly Asp Lys
 115 120 125
 Asn Ser Thr Ile Gly Gln Asn Gln Glu Glu Leu Asp Lys Gln Tyr Pro
 130 135 140
 Pro Thr Gly Ile Tyr Glu Asp Thr Lys Glu Ser Tyr Lys Leu Glu His
 145 150 155 160
 Val Lys Gly Ser Val Pro Asn Gly Lys Ser Glu Ala Lys Ala Val Asn
 165 170 175
 Pro Tyr Ser Ser Glu Gly Glu His Ile Arg Glu Ile Pro Glu Gly Thr
 180 185 190
 Leu Ser Lys Arg Ile Ser Glu Val Gly Asp Leu Ala His Asn Lys Tyr
 195 200 205
 Lys Ile Glu Leu Thr Val Ser Gly Lys Thr Ile Val Lys Pro Val Asp
 210 215 220
 Lys Gln Lys Pro Leu Asp Val Val Phe Val Leu Asp Asn Ser Asn Ser
 225 230 235 240
 Met Asn Asn Asp Gly Pro Asn Phe Gln Arg His Asn Lys Ala Lys Lys
 245 250 255
 Ala Ala Glu Ala Leu Gly Thr Ala Val Lys Asp Ile Leu Gly Ala Asn
 260 265 270
 Ser Asp Asn Arg Val Ala Leu Val Thr Tyr Gly Ser Asp Ile Phe Asp
 275 280 285
 Gly Arg Ser Val Asp Val Val Lys Gly Phe Lys Glu Asp Asp Lys Tyr
 290 295 300
 Tyr Gly Leu Gln Thr Lys Phe Thr Ile Gln Thr Glu Asn Tyr Ser His
 305 310 315 320
 Lys Gln Leu Thr Asn Asn Ala Glu Glu Ile Ile Lys Arg Ile Pro Thr
 325 330 335
 Glu Ala Pro Lys Ala Lys Trp Gly Ser Thr Thr Asn Gly Leu Thr Pro
 340 345 350

 Glu Gln Gln Lys Glu Tyr Tyr Leu Ser Lys Val Gly Glu Thr Phe Thr
 355 360 365
 Met Lys Ala Phe Met Glu Ala Asp Asp Ile Leu Ser Gln Val Asn Arg

370	375	380
Asn Ser Gln Lys Ile	Ile Val His Val Thr	Asp Gly Val Pro Thr Arg
385	390	400
Ser Tyr Ala Ile	Asn Asn Phe Lys Leu Gly Ala Ser Tyr Glu Ser Gln	415
405	410	415
Phe Glu Gln Met Lys Lys Asn Gly Tyr	Leu Asn Lys Ser Asn Phe Leu	430
420	425	430
Leu Thr Asp Lys Pro Glu Asp Ile Lys Gly Asn Gly Glu Ser Tyr Phe	440	445
435	440	445
Leu Phe Pro Leu Asp Ser Tyr Gln Thr Gln Ile Ile Ser Gly Asn Leu	450	460
450	455	460
Gln Lys Leu His Tyr Leu Asp Leu Asn Leu Asn Tyr Pro Lys Gly Thr	470	475
465	470	475
Ile Tyr Arg Asn Gly Pro Val Lys Glu His Gly Thr Pro Thr Lys Leu	485	490
485	490	495
Tyr Ile Asn Ser Leu Lys Gln Lys Asn Tyr Asp Ile Phe Asn Phe Gly	500	510
500	505	510
Ile Asp Ile Ser Gly Phe Arg Gln Val Tyr Asn Glu Glu Tyr Lys Lys	515	520
515	520	525
Asn Gln Asp Gly Thr Phe Gln Lys Leu Lys Glu Glu Ala Phe Lys Leu	530	540
530	535	540
Ser Asp Gly Glu Ile Thr Glu Leu Met Arg Ser Phe Ser Ser Lys Pro	545	555
545	550	560
Glu Tyr Tyr Thr Pro Ile Val Thr Ser Ala Asp Thr Ser Asn Asn Glu	565	570
565	570	575
Ile Leu Ser Lys Ile Gln Gln Gln Phe Glu Thr Ile Leu Thr Lys Glu	580	585
580	585	590
Asn Ser Ile Val Asn Gly Thr Ile Glu Asp Pro Met Gly Asp Lys Ile	595	600
595	600	605
Asn Leu Gln Leu Gly Asn Gly Gln Thr Leu Gln Pro Ser Asp Tyr Thr	610	615
610	615	620
Leu Gln Gly Asn Asp Gly Ser Val Met Lys Asp Gly Ile Ala Thr Gly	625	630
625	630	635
Gly Pro Asn Asn Asp Gly Gly Ile Leu Lys Gly Val Lys Leu Glu Tyr	645	650
645	650	655
Ile Gly Asn Lys Leu Tyr Val Arg Gly Leu Asn Leu Gly Glu Gly Gln	660	665
660	665	670
Lys Val Thr Leu Thr Tyr Asp Val Lys Leu Asp Asp Ser Phe Ile Ser	675	680
675	680	685
Asn Lys Phe Tyr Asp Thr Asn Gly Arg Thr Thr Leu Asn Pro Lys Ser	690	695
690	695	700
Glu Asp Pro Asn Thr Leu Arg Asp Phe Pro Ile Pro Lys Ile Arg Asp	705	710
705	710	715
Val Arg Glu Tyr Pro Thr Ile Thr Ile Lys Asn Glu Lys Lys Leu Gly	725	730
725	730	735
Glu Ile Glu Phe Ile Lys Val Asp Lys Asp Asn Asn Lys Leu Leu Leu	740	745
740	745	750
Lys Gly Ala Thr Phe Glu Leu Gln Glu Phe Asn Glu Asp Tyr Lys Leu	755	760
755	760	765
Tyr Leu Pro Ile Lys Asn Asn Asn Ser Lys Val Val Thr Gly Glu Asn	770	775
770	775	780
Gly Lys Ile Ser Tyr Lys Asp Leu Lys Asp Gly Lys Tyr Gln Leu Ile	785	790
785	790	795
Glu Ala Val Ser Pro Glu Asp Tyr Gln Lys Ile Thr Asn Lys Pro Ile	805	810
805	810	815

Leu Thr Phe Glu Val Val Lys Gly Ser Ile Lys Asn Ile Ile Ala Val
 820 825 830
 Asn Lys Gln Ile Ser Glu Tyr His Glu Glu Gly Asp Lys His Leu Ile
 835 840 845
 Thr Asn Thr His Ile Pro Pro Lys Gly Ile Ile Pro Met Thr Gly Gly
 850 855 860
 Lys Gly Ile Leu Ser Phe Ile Leu Ile Gly Gly Ala Met Met Ser Ile
 865 870 875 880
 Ala Gly Gly Ile Tyr Ile Trp Lys Arg Tyr Lys Lys Ser Ser Asp Met
 885 890 895
 Ser Ile Lys Lys Asp
 900

<210> 89
 <211> 869
 <212> PRT
 <213> Streptococcus agalactiae

<400> 89
 Met Arg Lys Tyr Gln Lys Phe Ser Lys Ile Leu Thr Leu Ser Leu Phe
 1 5 10 15
 Cys Leu Ser Gln Ile Pro Leu Asn Thr Asn Val Leu Gly Glu Ser Thr
 20 25 30
 Val Pro Glu Asn Gly Ala Lys Gly Lys Leu Val Val Lys Lys Thr Asp
 35 40 45
 Asp Gln Asn Lys Pro Leu Ser Lys Ala Thr Phe Val Leu Lys Thr Thr
 50 55 60
 Ala His Pro Glu Ser Lys Ile Glu Lys Val Thr Ala Glu Leu Thr Gly
 65 70 75 80
 Glu Ala Thr Phe Asp Asn Leu Ile Pro Gly Asp Tyr Thr Leu Ser Glu
 85 90 95
 Glu Thr Ala Pro Glu Gly Tyr Lys Lys Thr Asn Gln Thr Trp Gln Val
 100 105 110
 Lys Val Glu Ser Asn Gly Lys Thr Thr Ile Gln Asn Ser Gly Asp Lys
 115 120 125
 Asn Ser Thr Ile Gly Gln Asn Gln Glu Glu Leu Asp Lys Gln Tyr Pro
 130 135 140
 Pro Thr Gly Ile Tyr Glu Asp Thr Lys Glu Ser Tyr Lys Leu Glu His
 145 150 155 160
 Val Lys Gly Ser Val Pro Asn Gly Lys Ser Glu Ala Lys Ala Val Asn
 165 170 175
 Pro Tyr Ser Ser Glu Gly Glu His Ile Arg Glu Ile Pro Glu Gly Thr
 180 185 190
 Leu Ser Lys Arg Ile Ser Glu Val Gly Asp Leu Ala His Asn Lys Tyr
 195 200 205
 Lys Ile Glu Leu Thr Val Ser Gly Lys Thr Ile Val Lys Pro Val Asp
 210 215 220
 Lys Gln Lys Pro Leu Asp Val Val Phe Val Leu Asp Asn Ser Asn Ser
 225 230 235 240
 Met Asn Asn Asp Gly Pro Asn Phe Gln Arg His Asn Lys Ala Lys Lys
 245 250 255
 Ala Ala Glu Ala Leu Gly Thr Ala Val Lys Asp Ile Leu Gly Ala Asn
 260 265 270
 Ser Asp Asn Arg Val Ala Leu Val Thr Tyr Gly Ser Asp Ile Phe Asp
 275 280 285

Gly	Arg	Ser	Val	Asp	Val	Val	Lys	Gly	Phe	Lys	Glu	Asp	Asp	Lys	Tyr	
	290					295					300					
Tyr	Gly	Leu	Gln	Thr	Lys	Phe	Thr	Ile	Gln	Thr	Glu	Asn	Tyr	Ser	His	
	305				310					315					320	
Lys	Gln	Leu	Thr	Asn	Asn	Ala	Glu	Glu	Ile	Ile	Lys	Arg	Ile	Pro	Thr	
				325					330					335		
Glu	Ala	Pro	Lys	Ala	Lys	Trp	Gly	Ser	Thr	Thr	Asn	Gly	Leu	Thr	Pro	
			340					345					350			
Glu	Gln	Gln	Lys	Glu	Tyr	Tyr	Leu	Ser	Lys	Val	Gly	Glu	Thr	Phe	Thr	
			355				360					365				
Met	Lys	Ala	Phe	Met	Glu	Ala	Asp	Asp	Ile	Leu	Ser	Gln	Val	Asn	Arg	
	370					375						380				
Asn	Ser	Gln	Lys	Ile	Ile	Val	His	Val	Thr	Asp	Gly	Val	Pro	Thr	Arg	
	385				390					395					400	
Ser	Tyr	Ala	Ile	Asn	Asn	Phe	Lys	Leu	Gly	Ala	Ser	Tyr	Glu	Ser	Gln	
				405					410					415		
Phe	Glu	Gln	Met	Lys	Lys	Asn	Gly	Tyr	Leu	Asn	Lys	Ser	Asn	Phe	Leu	
			420					425						430		
Leu	Thr	Asp	Lys	Pro	Glu	Asp	Ile	Lys	Gly	Asn	Gly	Glu	Ser	Tyr	Phe	
			435				440					445				
Leu	Phe	Pro	Leu	Asp	Ser	Tyr	Gln	Thr	Gln	Ile	Ile	Ser	Gly	Asn	Leu	
	450					455					460					
Gln	Lys	Leu	His	Tyr	Leu	Asp	Leu	Asn	Leu	Asn	Tyr	Pro	Lys	Gly	Thr	
	465				470					475					480	
Ile	Tyr	Arg	Asn	Gly	Pro	Val	Lys	Glu	His	Gly	Thr	Pro	Thr	Lys	Leu	
				485				490						495		
Tyr	Ile	Asn	Ser	Leu	Lys	Gln	Lys	Asn	Tyr	Asp	Ile	Phe	Asn	Phe	Gly	
			500					505					510			
Ile	Asp	Ile	Ser	Gly	Phe	Arg	Gln	Val	Tyr	Asn	Glu	Glu	Tyr	Lys	Lys	
	515						520					525				
Asn	Gln	Asp	Gly	Thr	Phe	Gln	Lys	Leu	Lys	Glu	Glu	Ala	Phe	Lys	Leu	
	530					535					540					
Ser	Asp	Gly	Glu	Ile	Thr	Glu	Leu	Met	Arg	Ser	Phe	Ser	Ser	Lys	Pro	
	545				550					555					560	
Glu	Tyr	Tyr	Thr	Pro	Ile	Val	Thr	Ser	Ala	Asp	Thr	Ser	Asn	Asn	Glu	
			565						570					575		
Ile	Leu	Ser	Lys	Ile	Gln	Gln	Gln	Phe	Glu	Thr	Ile	Leu	Thr	Lys	Glu	
			580					585					590			
Asn	Ser	Ile	Val	Asn	Gly	Thr	Ile	Glu	Asp	Pro	Met	Gly	Asp	Lys	Ile	
	595						600					605				
Asn	Leu	Gln	Leu	Gly	Asn	Gly	Gln	Thr	Leu	Gln	Pro	Ser	Asp	Tyr	Thr	
	610				615						620					
Leu	Gln	Gly	Asn	Asp	Gly	Ser	Val	Met	Lys	Asp	Gly	Ile	Ala	Thr	Gly	
	625				630					635				640		
Gly	Pro	Asn	Asn	Asp	Gly	Gly	Ile	Leu	Lys	Gly	Val	Lys	Leu	Glu	Tyr	
				645				650						655		
Ile	Gly	Asn	Lys	Leu	Tyr	Val	Arg	Gly	Leu	Asn	Leu	Gly	Glu	Gly	Gln	
		660						665					670			
Lys	Val	Thr	Leu	Thr	Tyr	Asp	Val	Lys	Leu	Asp	Asp	Ser	Phe	Ile	Ser	
		675					680					685				
Asn	Lys	Phe	Tyr	Asp	Thr	Asn	Gly	Arg	Thr	Thr	Leu	Asn	Pro	Lys	Ser	
	690					695					700					
Glu	Asp	Pro	Asn	Thr	Leu	Arg	Asp	Phe	Pro	Ile	Pro	Lys	Ile	Arg	Asp	
	705				710					715				720		
Val	Arg	Glu	Tyr	Pro	Thr	Ile	Thr	Ile	Lys	Asn	Glu	Lys	Lys	Leu	Gly	

725 730 735
 Glu Ile Glu Phe Ile Lys Val Asp Lys Asp Asn Asn Lys Leu Leu Leu
 740 745 750
 Lys Gly Ala Thr Phe Glu Leu Gln Glu Phe Asn Glu Asp Tyr Lys Leu
 755 760 765
 Tyr Leu Pro Ile Lys Asn Asn Asn Ser Lys Val Val Thr Gly Glu Asn
 770 775 780
 Gly Lys Ile Ser Tyr Lys Asp Leu Lys Asp Gly Lys Tyr Gln Leu Ile
 785 790 800
 Glu Ala Val Ser Pro Glu Asp Tyr Gln Lys Ile Thr Asn Lys Pro Ile
 805 810 815
 Leu Thr Phe Glu Val Val Lys Gly Ser Ile Lys Asn Ile Ile Ala Val
 820 825 830
 Asn Lys Gln Ile Ser Glu Tyr His Glu Glu Gly Asp Lys His Leu Ile
 835 840 845
 Thr Asn Thr His Ile Pro Pro Lys Gly Ile Ile Pro Met Thr Gly Gly
 850 855 860
 Lys Gly Ile Leu Ser
 865

<210> 90
 <211> 5
 <212> PRT
 <213> Streptococcus agalactiae

<400> 90
 Ile Pro Met Thr Gly
 1 5

<210> 91
 <211> 858
 <212> PRT
 <213> Streptococcus agalactiae

<400> 91
 Met Arg Lys Tyr Gln Lys Phe Ser Lys Ile Leu Thr Leu Ser Leu Phe
 1 5 10 15
 Cys Leu Ser Gln Ile Pro Leu Asn Thr Asn Val Leu Gly Glu Ser Thr
 20 25 30
 Val Pro Glu Asn Gly Ala Lys Gly Lys Leu Val Val Lys Lys Thr Asp
 35 40 45
 Asp Gln Asn Lys Pro Leu Ser Lys Ala Thr Phe Val Leu Lys Thr Thr
 50 55 60
 Ala His Pro Glu Ser Lys Ile Glu Lys Val Thr Ala Glu Leu Thr Gly
 65 70 75 80
 Glu Ala Thr Phe Asp Asn Leu Ile Pro Gly Asp Tyr Thr Leu Ser Glu
 85 90 95
 Glu Thr Ala Pro Glu Gly Tyr Lys Lys Thr Asn Gln Thr Trp Gln Val
 100 105 110
 Lys Val Glu Ser Asn Gly Lys Thr Thr Ile Gln Asn Ser Gly Asp Lys
 115 120 125
 Asn Ser Thr Ile Gly Gln Asn Gln Glu Glu Leu Asp Lys Gln Tyr Pro
 130 135 140
 Pro Thr Gly Ile Tyr Glu Asp Thr Lys Glu Ser Tyr Lys Leu Glu His
 145 150 155 160

Val	Lys	Gly	Ser	Val	Pro	Asn	Gly	Lys	Ser	Glu	Ala	Lys	Ala	Val	Asn
				165				170						175	
Pro	Tyr	Ser	Ser	Glu	Gly	Glu	His	Ile	Arg	Glu	Ile	Pro	Glu	Gly	Thr
			180					185						190	
Leu	Ser	Lys	Arg	Ile	Ser	Glu	Val	Gly	Asp	Leu	Ala	His	Asn	Lys	Tyr
		195					200					205			
Lys	Ile	Glu	Leu	Thr	Val	Ser	Gly	Lys	Thr	Ile	Val	Lys	Pro	Val	Asp
	210					215				220					
Lys	Gln	Lys	Pro	Leu	Asp	Val	Val	Phe	Val	Leu	Asp	Asn	Ser	Asn	Ser
225				230						235				240	
Met	Asn	Asn	Asp	Gly	Pro	Asn	Phe	Gln	Arg	His	Asn	Lys	Ala	Lys	Lys
				245				250						255	
Ala	Ala	Glu	Ala	Leu	Gly	Thr	Ala	Val	Lys	Asp	Ile	Leu	Gly	Ala	Asn
			260					265					270		
Ser	Asp	Asn	Arg	Val	Ala	Leu	Val	Thr	Tyr	Gly	Ser	Asp	Ile	Phe	Asp
		275					280					285			
Gly	Arg	Ser	Val	Asp	Val	Val	Lys	Gly	Phe	Lys	Glu	Asp	Asp	Lys	Tyr
	290					295					300				
Tyr	Gly	Leu	Gln	Thr	Lys	Phe	Thr	Ile	Gln	Thr	Glu	Asn	Tyr	Ser	His
305				310						315				320	
Lys	Gln	Leu	Thr	Asn	Asn	Ala	Glu	Glu	Ile	Ile	Lys	Arg	Ile	Pro	Thr
				325				330						335	
Glu	Ala	Pro	Lys	Ala	Lys	Trp	Gly	Ser	Thr	Thr	Asn	Gly	Leu	Thr	Pro
			340					345					350		
Glu	Gln	Gln	Lys	Glu	Tyr	Tyr	Leu	Ser	Lys	Val	Gly	Glu	Thr	Phe	Thr
		355					360					365			
Met	Lys	Ala	Phe	Met	Glu	Ala	Asp	Asp	Ile	Leu	Ser	Gln	Val	Asn	Arg
	370					375					380				
Asn	Ser	Gln	Lys	Ile	Ile	Val	His	Val	Thr	Asp	Gly	Val	Pro	Thr	Arg
385				390						395				400	
Ser	Tyr	Ala	Ile	Asn	Asn	Phe	Lys	Leu	Gly	Ala	Ser	Tyr	Glu	Ser	Gln
				405				410						415	
Phe	Glu	Gln	Met	Lys	Lys	Asn	Gly	Tyr	Leu	Asn	Lys	Ser	Asn	Phe	Leu
			420					425					430		
Leu	Thr	Asp	Lys	Pro	Glu	Asp	Ile	Lys	Gly	Asn	Gly	Glu	Ser	Tyr	Phe
		435				440						445			
Leu	Phe	Pro	Leu	Asp	Ser	Tyr	Gln	Thr	Gln	Ile	Ile	Ser	Gly	Asn	Leu
		450				455						460			
Gln	Lys	Leu	His	Tyr	Leu	Asp	Leu	Asn	Leu	Asn	Tyr	Pro	Lys	Gly	Thr
465				470						475				480	
Ile	Tyr	Arg	Asn	Gly	Pro	Val	Lys	Glu	His	Gly	Thr	Pro	Thr	Lys	Leu
			485					490						495	
Tyr	Ile	Asn	Ser	Leu	Lys	Gln	Lys	Asn	Tyr	Asp	Ile	Phe	Asn	Phe	Gly
		500						505					510		
Ile	Asp	Ile	Ser	Gly	Phe	Arg	Gln	Val	Tyr	Asn	Glu	Glu	Tyr	Lys	Lys
		515					520					525			
Asn	Gln	Asp	Gly	Thr	Phe	Gln	Lys	Leu	Lys	Glu	Glu	Ala	Phe	Lys	Leu
		530				535						540			
Ser	Asp	Gly	Glu	Ile	Thr	Glu	Leu	Met	Arg	Ser	Phe	Ser	Ser	Lys	Pro
545				550						555				560	
Glu	Tyr	Tyr	Thr	Pro	Ile	Val	Thr	Ser	Ala	Asp	Thr	Ser	Asn	Asn	Glu
				565						570				575	
Ile	Leu	Ser	Lys	Ile	Gln	Gln	Gln	Phe	Glu	Thr	Ile	Leu	Thr	Lys	Glu
			580					585					590		
Asn	Ser	Ile	Val	Asn	Gly	Thr	Ile	Glu	Asp	Pro	Met	Gly	Asp	Lys	Ile

595				600				605							
Asn	Leu	Gln	Leu	Gly	Asn	Gly	Gln	Thr	Leu	Gln	Pro	Ser	Asp	Tyr	Thr
610				615						620					
Leu	Gln	Gly	Asn	Asp	Gly	Ser	Val	Met	Lys	Asp	Gly	Ile	Ala	Thr	Gly
625				630						635					640
Gly	Pro	Asn	Asn	Asp	Gly	Gly	Ile	Leu	Lys	Gly	Val	Lys	Leu	Glu	Tyr
			645						650					655	
Ile	Gly	Asn	Lys	Leu	Tyr	Val	Arg	Gly	Leu	Asn	Leu	Gly	Glu	Gly	Gln
			660						665					670	
Lys	Val	Thr	Leu	Thr	Tyr	Asp	Val	Lys	Leu	Asp	Asp	Ser	Phe	Ile	Ser
			675				680							685	
Asn	Lys	Phe	Tyr	Asp	Thr	Asn	Gly	Arg	Thr	Thr	Leu	Asn	Pro	Lys	Ser
690						695				700					
Glu	Asp	Pro	Asn	Thr	Leu	Arg	Asp	Phe	Pro	Ile	Pro	Lys	Ile	Arg	Asp
705				710						715				720	
Val	Arg	Glu	Tyr	Pro	Thr	Ile	Thr	Ile	Lys	Asn	Glu	Lys	Lys	Leu	Gly
			725						730					735	
Glu	Ile	Glu	Phe	Ile	Lys	Val	Asp	Lys	Asp	Asn	Asn	Lys	Leu	Leu	
			740				745							750	
Lys	Gly	Ala	Thr	Phe	Glu	Leu	Gln	Glu	Phe	Asn	Glu	Asp	Tyr	Lys	Leu
			755			760								765	
Tyr	Leu	Pro	Ile	Lys	Asn	Asn	Asn	Ser	Lys	Val	Val	Thr	Gly	Glu	Asn
770						775					780				
Gly	Lys	Ile	Ser	Tyr	Lys	Asp	Leu	Lys	Asp	Gly	Lys	Tyr	Gln	Leu	Ile
785				790						795				800	
Glu	Ala	Val	Ser	Pro	Glu	Asp	Tyr	Gln	Lys	Ile	Thr	Asn	Lys	Pro	Ile
			805						810					815	
Leu	Thr	Phe	Glu	Val	Val	Lys	Gly	Ser	Ile	Lys	Asn	Ile	Ile	Ala	Val
			820						825					830	
Asn	Lys	Gln	Ile	Ser	Glu	Tyr	His	Glu	Glu	Gly	Asp	Lys	His	Leu	Ile
			835				840							845	
Thr	Asn	Thr	His	Ile	Pro	Pro	Lys	Gly	Ile						
850						855									